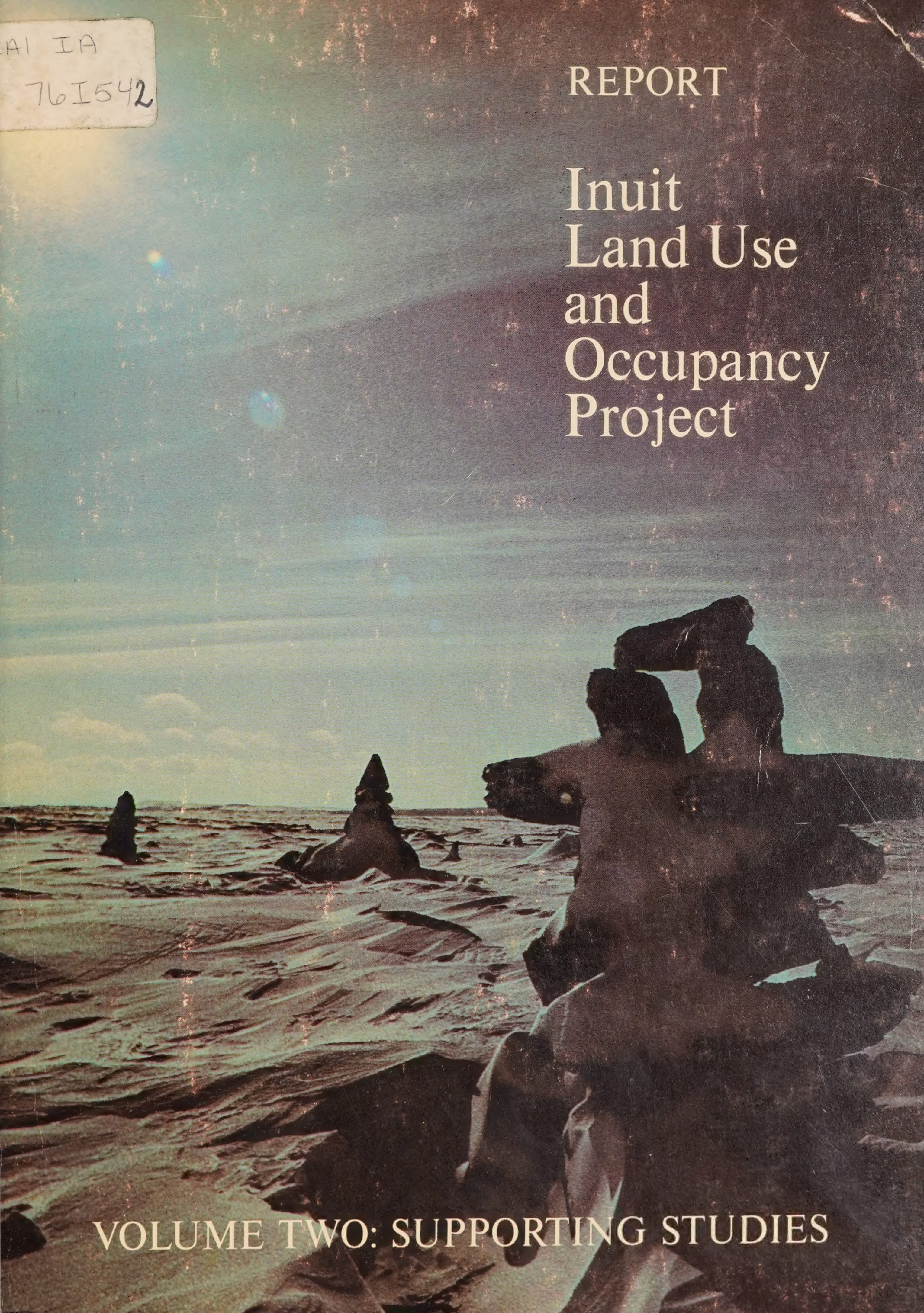
REPORT

Inuit Land Use and Occupancy Project



VOLUME TWO: SUPPORTING STUDIES

Indian and
Northern Affairs

Affaires indiennes
et du Nord

Inuit Land Use and Occupancy Project

REPORT

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VOLUME TWO: SUPPORTING STUDIES

A report prepared by
Milton Freeman Research Limited
under contract with the
Department of Indian and
Northern Affairs

This report is published in three volumes:
Volume One: Land Use and Occupancy
Volume Three: Land Use Atlas

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Foreword

The Inuit Land Use and Occupancy Project was initiated at the request of Inuit Tapirisat of Canada. Following preliminary discussions in 1972 and 1973, Milton Freeman Research Limited was incorporated on 18 June, 1973, in order to undertake research into Inuit use and occupancy of the land, with funds advanced by the Department of Indian and Northern Affairs. After the research had begun, a Steering Committee regularly met to oversee the interests of the federal government and Inuit Tapirisat of Canada in the Project.

Letter of Endorsement

The Contract between Her Majesty and Milton Freeman Research Limited to carry out the Inuit Land Use and Occupancy Project called for the establishment of a Steering Committee to advise the Minister on the overall progress of the Project. The Steering Committee, consisting of two members appointed by the Minister and two by Inuit Tapirisat of Canada, met five times, reviewed the progress reports and financial statements of the Project, and found them satisfactory.

For the Federal Government	*For Inuit Tapirisat of Canada*
Mr. A. Stevenson	Mr. T. E. C. Curley
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Preface

In February 1973 Inuit Tapirisat of Canada proposed to the Minister of Indian and Northern Affairs that research be undertaken to produce a comprehensive and verifiable record of Inuit land use and occupancy in the Northwest Territories of Canada.

The record so obtained would delimit the present and past use and occupation of the land and marine environment and would categorise the uses which any particular area served. In view of the continuing role which land plays in defining the cultural and ecologic circumstances of Inuit society, the research was also to provide an explicit statement — *by the Inuit* — of their perception of the man-land relationship. The results of this research are published in three volumes. The land use reports presented in Volume One are grouped into "regions" that were constituted more for administrative and logistic purposes than to reflect any profound cultural or political northern realities.

There is variation in the manner in which land use reports have been written. Though these reports could have been standardized, it was decided that several advantages followed from diversity: first, the special skills and insights of the different authors are retained; secondly, this exposes the reader to several different viewpoints or facets of an important topic. It is important that the reader note that with the exception of the short settlement histories prresented for each contemporary community, virtually all textual material was derived from fieldworkers' discussions with Inuit informants. By thus restricting the material presented to that derived directly from recent fieldwork, we have attempted to meet our objective of setting down the Inuit view relating to land use and occupation.

We have adopted a different means of presenting land occupancy data in Volume One. Insofar as we now believe that Inuit, irrespective of location, share a common viewpoint in respect to values, attitudes and sentiments toward the land, we have presented one report on occupancy rather than a series of similar reports from each of the regions. The geographical location of the quoted respondents indicates the widespread commonalty of viewpoint in discussing the land, irrespective of residence or origin of the speaker. It was necessary to annotate the material presented in the occupancy report, for many of the printed quotes are taken from lengthy expositions on a given topic. The transcripts of all tapes collected and translated are on permanent deposit at the Public Archives in Ottawa, together with the original tapes and all other project materials.

In Volume Two, a series of reports have been assembled to provide the reader with information useful for a better understanding of the land use and occupancy data presented in Volumes One and Three.

Part I of Volume Two contains background to the present study; Part II presents information relating to prehistoric occupation of the Canadian north; Part III explains something of the nature of Inuit cultural adaptation to life in the Arctic, and Part IV is a complement to the occupancy report in Volume One, using photographs to add a visual dimension to the statements of Inuit concerning their feelings for, and cultural dependence upon their lands.

Volume Three includes the land use maps illustrating the extent of land use described in Volume One. Due to the complexity of mapping, certain "minor" land use activities described in the reports have been omitted from the maps. Other map series were prepared by the project, but for practical reasons are not published in full; the reader is referred to the occupancy report for representative samples of place name maps, cultural maps, wildlife resource maps, and travel route maps.

No single study can satisfactorily provide answers to all classes of question that might be asked about a people's relationship to their land, unless that study be of immense proportions. In planning and carrying out the Inuit Land Use and Occupancy Project, constraints of time more especially required that we set priorities both with respect to the sorts of data that should be collected and with their subsequent analysis and publication.

The main determinant of the final form of this report however, has necessarily been consideration of balance in trying to describe accurately the voluminous documentation now available describing the different Inuit groups occupying and using the approximately 1.5 million square miles of northern Canada that constitute their domain. An important requirement of our work was to present, in explicit and unambiguous fashion, information in support of the fact that Inuit have used and occupied this vast northern land since time immemorial and that they still use and occupy it to this day.

Note

Inuit/Eskimo

The Canadian Inuit increasingly, when speaking in English or French, use their own word for themselves, namely Inuit (singular, Inuk). This term has come to replace "Eskimos" or "Esquimaux", which are, respectively, the English and French renditions of the Cree word "Askimawak".

Thus throughout this report, the historic inhabitants of Arctic Canada are referred to as Inuit. However, because the Alaskan Eskimos do not refer to themselves as Inuit, and because the various prehistoric occupants of the Arctic regions are known in the literature as "Eskimos", this term is used where appropriate to those particular circumstances.

Spelling

The absence of a standardized writing system and actual dialect differences from area to area combine to produce considerable variation in the written form of the Eskimo language. It has not been possible therefore, to standardize the spelling of Inuit personal names, names of local groupings, or local Inuit place names that appear in the reports that follow. Some of these renderings have become well established because of their authors place in history; for example, the Danish ethnographers of the Fifth Thule Expedition of 1921–1924 have given us names such as Padlimiut, Harvaqtormiut, Hauneqtormiut, and Qaernermiut for some of the people of the Barren Grounds. These spellings are used by Welland in his land use report in Volume One and by Hoffman in Volume Two. However, Correll (a linguist, who writes in Volume Two) prefers to represent these same names as Paatlimiut, Saqvaqturmiut, Sauniqturmiut, and Qairnirmiut

In the case of reprinted articles (in Volume Two), all names and words in the Eskimo language appear as originally published.

Part I:

Background and Technical Considerations

Introduction

One of our main concerns, which is outlined in the methodology paper that follows below, has been the attempt to collect information and subsequently to represent it in a manner that accords with the perceptions of the Inuit themselves. Many studies, related in some way to land use, have been made in various parts of northern Canada. Some of them stand out as having been well designed, nobly motivated and often conscientiously executed in an effort to help the people of the north secure a greater measure of well-being. During a 10-year period in the 1950's and 1960's, the Department of Indian Affairs and Northern Development, formerly the Department of Northern Affairs and National Resources, commissioned a series of area economic surveys, which were valuable additions to this sort of work.

As background to this present study we asked J. Lotz, a former member of the group that was responsible for conducting those area economic surveys, to evaluate the reports in retrospect. Lotz praises their thoroughness in realizing the goals set, which included compiling resource inventories and analysing the prevailing economic conditions in the areas studied.

The main shortcoming, from the Inuit point of view, and, perhaps from the point of view of an enlightened administration, was that those surveys paid little attention to the perceptions of the local people: the reports achieved admirable objectivity and were full of detailed information, but they also carried a high degree of irrelevance, and consequently, errors in interpretation.

The earlier area economic surveys provided a useful lesson for those planning the Inuit land use study. Our need was to collaborate closely with the Inuit themselves in designing a study that would lead to an explicit and accurate statement of their historical use and occupancy of their lands and would meet their own criteria of accuracy and relevancy. We hoped that such a study would also be useful to those non-Inuit whose work, intellectual interests, and sympathies lead them to wish to know and understand more about Inuit use and occupation of the Canadian Arctic.

It was soon apparent in the early planning of this study that interviews of individual hunters in the northern communities must be the basis of the work However, such interviews in contemporary communities in the north are not easily made for the population is mobile and the people in any given settlement will have come from various other places. The problems associated with "scientific" or representative sampling in such circumstances suggested that it might be easier to aim at a complete survey of adult Inuit hunters — that is, we should try to interview every Inuit male who had independently hunted, trapped, or fished, whatever his age, experience, or place of origin.

This study is, therefore, based on what social scientists call "informant recall". Our fieldworkers attempted to record the hunting range for most species of animals together with trapping, fishing, and camping locations on topographic maps of a suitable scale.

We anticipated that the question would subsequently be asked: "How reliable is informant recall, especially when information relating to several or many past years is being sought?" As pointed out in the methodology paper that follows, informant recall is the basis of the work of ethnologists and anthropologists during the past century and the only means there is of recording and understanding something of the history, culture, language, and social arrangements of pre-literate societies all over the world. Members of pre-literate societies are *taught* at an early age to remember, and to remember accurately, the small details of everyday life, and especially — in the case of a male in a hunting society — details associated with hunting and the environment.

Many Whites who have visited the north have been amazed by the detail of the Inuit language, especially in its words for natural phenomena, such as snow, or caribou, or weather. Others have been struck by the large number of string fingers that an individual can execute at lightning speed, or the ability of an Inuk hunter to take apart an engine or watch and reassemble it, or to find his way across apparently featureless snow or ice. The main reason for the individual's ability to succeed in these varied tasks is memory — not necessarily an inherently better brain than that of other peoples, but a well trained facility that is used to discriminate precisely and to retain the constituent elements of a situation for future recall and use.

Elsewhere in this collection of papers, Nelson presents evidence of this facility. Arima also presents evidence to support the notion that our reliance on Inuit informant recall is not misplaced, but that, within the time span of which we ask our informants to speak (i.e. their own adult lives), there is a good and proven ability for extensive and accurate recall. Arima uses several types of evidence to support his conclusion; and our fieldworkers had independent evidence of the hunters' concern to give accurate and complete information, both during the interviews with individuals and at subsequent feedback sessions, during which the members of a community painstakingly and collectively examined the maps, calling attention to errors, which, significantly, were generally errors of omission. The methodology paper also makes the point that, in their concern for the true and accurate representation, our informants invariably tended toward understatement: if a fact was not certainly known, it was usually omitted, or it was verified before being recorded.

The main aid external to Inuit society that was used in the interviews was the appropriate series of topographic maps

that covered the region used by the respondent. How good is the Inuit hunters' understanding of or ability to use these maps?

One reason for choosing maps at a scale of 1:500,000 was that most hunters and trappers in the north today use these maps with some regularity. Such maps, despite their errors and small scale, are nevertheless useful when discussing the land with non-local people, who in the changing north increasingly include other Inuit as well as non-Inuit.

The perceptions of the Inuit, in respect to travel through two dimensions, and in respect to distinctions between land and water surfaces, provided no major problems. Indeed, some elementary geography books and many encyclopedias include examples of maps that the Inuit produced for early white explorers, and these maps illustrate the tremendous extent of their topographic knowledge and their remarkable cartographic ability.

This evidence has been collected and documented by Spink and Moodie. For most geographers, the map is the basic means of representing our understanding of the world, and without such tools our knowledge of the world decreases. The Inuit have always had detailed knowledge of their world; they find it of intrinsic value to themselves and regard this knowledge as a priceless possession to be passed on to future generations. The care, yet ease, with which the hunters traced their life stories on the project maps gave rise to feelings of wonder and humility among the fieldworkers who had the privilege of helping to record this heritage.

The task nevertheless remained of collecting the data accurately and with attention given to the different – yet certainly valid – perceptions of the informants themselves. To some extent, the project's need to collect data that were amenable to classification, storage, retrieval, and analysis conflicted with ways in which the Inuit might themselves choose to organize information about their land use. These different perceptions are illustrated in one section of the methodology paper. For example, as non-Inuit, it seemed reasonable to us to speak of ringed seal hunting, say, and to distinguish this activity not only from such other activities as narwhal, walrus, caribou, or wolverine hunting, but also from harp seal, bearded seal, and harbour seal hunting. We would go no further in our discrimination, whereas to ask an Inuk hunter "Where do you hunt ringed seals?" is as crude a question as asking an expert fisherman "Where do you fish?" No proper answer can be given unless the question is qualified with reference to season, weather, age and behaviour of the seals, and the specific requirement to be met by the hunt and so on. In the sense, therefore, of representing the fine discriminations that the Inuit themselves make concerning their land use activity, we have failed to match Inuit perceptions in our representation of their land. On the other hand, we have attempted to indicate elsewhere in this report that such discriminations are important to the Inuit: we address these problems in the methodology paper which follows and in the occupancy section of Volume One. A series of wildlife resource maps was compiled for each region to illustrate the detailed and extensive context and the fine discrimination of the Inuit in their perceptions of the environment. Only a few of these maps could be published in Volume One, but the others are available and are included in the extensive archives of the project, and we hope they will be published later.

We have attempted to minimize the cultural bias inherent in our "scientific" treatment of the data collected by ensuring that even the smallest items of data that we collected would remain in their disaggregated form somewhere within the information storage system we have employed, so that whatever elaboration we have subjected them to – either for display in text, tables, or maps, or for storage or analysis, the basic integrity of the interviews with the individual hunters will remain intact.

The task appeared formidable. We anticipated having to make about 2,000 individual interviews, for that was our estimate of the number of adult Inuit hunters living in the Northwest Territories. The individuals were living in 33 different communities, and many of them had lived in two or more such communities at some previous time. One person's total adult experience on the land might cover more than 50 years, and we had also made a list of more than 30 different categories of land use that it seemed to us important to distinguish.

The problems to be settled fell into two sets: the first related to fieldwork procedures, and the second related to data-handling procedures. The two were of course linked, for any system designed to present such information would influence the choice of fieldwork procedures, and data-handling at a later stage would also depend on the broad classes of information that the fieldwork had produced.

Another major problem was the question of scale. The central unit of fieldwork was the individual interview, but we knew that a hunter may have used a geographical area of many hundreds of square miles. Into what size of unit were we to divide, for analytical purposes, a million and a half square miles? Fifty square mile bits of land? Ten? One hundred?

The answer was provided by one of our associates, who has outlined his reasoning in a paper in this volume entitled, "Rationale for a Comprehensive Land Use Data-Base". In this paper, Philbrick points out that a system to store and analyze such a huge volume of variable data must itself have the capacity for flexibility, otherwise the mass of data will create an inertia so great that it would preclude its ever being used to answer the questions unanticipated at the early stages of data collection. Inevitably, as seems to be true of all research endeavours, the one certain conviction at the end of it is that more research should be done to carry forward what

has just been finished. The anticipation of this inevitable conclusion is neither clever nor prescient, but merely prudent. Two of the project's associates, Masterson and Bhargava, have designed, economically and pragmatically, an electronic data storage system that could accommodate the land use data of every individual hunter in any of 33 land use categories during any of the four different time periods on any identifiable unit of land 25 square kilometres (9.6 square miles) in extent. Thus, for example, if information is wanted on walrus hunting at a given location during a certain defined time period, the information can be recovered either by named communities or by geographical coordinates that can define any area ranging in size from the whole of the Northwest Territories down to about 10 square miles. This recovery can be effected with our data for most species of major importance to the human economy of the north or for any combination of these species, and the information can be shown either in map or tabular form.

One thing that is immediately apparent on examination of the statistical data presented as tabulations in Philbrick's paper: Inuit hunters have used huge areas of land in the past and they continue using similar-sized areas at the present time. The fact that the "average" hunter in Spence Bay, say, has used 2,100 square miles of sea and sea ice to hunt ringed seals during his lifetime is as unsuspected to most persons as the fact that yet other hunters in Spence Bay have used up to 5,600 square miles for the same purpose. Yet in Paulatuk, for example, the "average" hunter uses only about 1,000 square miles for this purpose, and no one there seems to have used more than 2,000 square miles to hunt ringed seals. Understanding and explanation of such variations is not the main purpose of this study – we are here more concerned with the presentation of historical facts, and we recognize that detailed analyses of the data we have collected remain to be done.

Both environment and culture affect human behaviour. The paper by Peterson is addressed particularly to the environmental background to an understanding of human ecological adaptation in the Canadian Arctic. As Peterson makes quite evident, there are great variations in biological productivity from place to place, and even from year to year at the same place, in the Arctic. Places might vary by orders of magnitude even though located, geographically, quite close together. Many of these variations, which have only recently become known to scientists, have been known empirically to generations of Inuit. An example of this is Grainger's findings (reported in Peterson's paper) that biological productivity on the western side of Foxe Basin is twice as great as that on the eastern side. The Inuit hunters at Igloolik have always known this in the sense that they are well aware that the largest walruses are to be found in the western part of Foxe Basin. The explanations offered in Peterson's paper go some way to explaining the biological differences between the different regions and the different environments of northern Canada. We may surmise that a possible reason why the "average" Spence Bay hunter ranges over a much larger area than the Paulatuk hunter is due, at least in part, to the difference in biological productivity between the two locations. We say "a possible reason" and is due "in part" because few persons today believe that environment alone determines human behaviour, least of all among a people, such as the Inuit, who have succeeded in occupying for so long a geographical zone that has such extremes of climate. Cultural reasons are clearly of great importance, yet our report hardly more than touches this aspect of Inuit occupation.

It soon became apparent in our fieldwork that cultural factors, especially perception of the environment, were causing problems with the methodological procedures we had adopted as a means of standardizing our description of Inuit occupation throughout all regions of northern Canada. Whereas it seemed reasonable (because it seemed to work in nearly all cases) to ask an adult Inuk in Paulatuk, Pond Inlet, or Pelly Bay to mark on a map where he had fished, trapped, or hunted caribou, the same questions might get a very different sort of response in Baker Lake, Whale Cove, or Eskimo Point. The differences in these cases were not environmental but cultural: the populations of Baker Lake, Whale Cove, and Eskimo Point were, until recently, inland people, and they were rarely or minimally oriented toward the exploitation of marine resources. Perhaps, it seemed reasonable to suppose, there was some basic cultural difference here, a difference occasioned (not necessarily determined) by the separation of the inland groups from maritime groups, who thus drifted – culturally – apart. But, whatever the cause, the effects caused us problems. Land use maps among some inland-oriented hunters of Keewatin District showed areas of fishing and trapping that were nearly as great as the areas these same individuals had covered for caribou hunting. It was not that our Keewatin respondents or fieldworkers took less care – on the contrary – the fact was that our methods and underlying perceptions were in sharp contrast to those of our respondents and, in attempting to meet our needs, the representation of their information became distorted.

The resolution to this problem, in both conceptual and empirical terms, is made clear in Hoffman's paper on land use among the inland people. By focussing attention on a few sample years of land use, among a few individual hunters who had formerly lived deep inland on the Barren Grounds, Hoffman illustrates how the cognitive and practical separation of distinct subsistence activities becomes meaningless when caribou play such a dominant part in the seasonal cycle of activity among these people: they need to hunt caribou to trap foxes, and they only fish while waiting for caribou. Some numerical conversions are nevertheless possible, and it appears that the actual fishing areas rarely cover more than

about 10 per cent of the land area that the hunters are likely to range over for caribou.

The papers that follow are intended as background to the aims and procedures adopted by the Inuit Land Use and Occupancy Project.

Area Economic Surveys: Critique and Assessment

by Jim Lotz*

Introduction

Between 1958 and 1968, members of the Industrial Division of the Northern Administration Branch of the (then) Department of Northern Affairs and National Resources, and some contract personnel, carried out a series of Area Economic Surveys in land occupied by the Inuit. The northern survey officers visited every part of Inuit territory lying between Herschel Island in the west and southern Ellesmere Island in the east. The southern limit of the surveys followed the treeline, and a line from M'Clure Strait to Jones Sound marked the northern limit. Prince Charles Island, west central Baffin Island and the Nettilling Lake region were not covered (Map 57). In all, 16 area surveys were completed and 15 published reports were produced, containing about 2,500 pages or about one and a quarter million words, with accompanying maps, photographs and tables.

The Objectives of the Surveys

The main aim of these surveys was to determine what use was being made of the resources in the areas, and to suggest ways in which the Inuit people could be helped to make more effective use of these resources, or to take advantage of unused resources. The northern survey officers visited the areas during the summer, and usually wrote up their reports in Ottawa over the following winter.

The first report (Evans 1958), proposed a program of economic development for the Inuit of the Ungava Bay region based on seal hunting, char, cod, and shark fishing, lumbering, handicrafts, and blueberry picking.

Four years passed until the next report (Brack 1962) was published based on fieldwork carried out between mid-June and October 1961, on Southampton Island, and to a lesser extent at Repulse Bay. The main aim of this report was to determine whether Southampton Island and adjacent areas could support a larger population, as and when the North Rankin Nickel Mine (at nearby Rankin Inlet) closed down.

Three reports appeared in 1963, dealing with the region around and to the east of Tuktoyaktuk (Abrahamson 1963), the west coast of Ungava Bay (Currie 1963), and the mainland settlements of the Keewatin region (Brack and McIntosh 1963). These reports suggested ways of reducing unemployment, high welfare costs and various other social problems in the regions.

In 1964 a report on the arctic coastal region of the Yukon Territory (Currie 1964) appeared, and in similar fashion to earlier reports, made a series of proposals aimed at assessing the potential of the region for the purpose of offering employment possibilities and improving the general welfare of the local population now gathering in the new administrative centre of Inuvik.

A report on the Copper Inuit (Abrahamson *et al.* 1964) was carried out to determine the impact on the local population of the proposed closing of the Hudson's Bay Company trading post at Bathurst Inlet. This particular report was the last of the "crisis-oriented" surveys, for starting in 1965 the reports that followed attempted to present proposals for improving the lives of the local populations within a general assessment of regional and local resources.

In 1966 there were two reports published, one dealing with Banks Island (Usher 1966), the other with the northern parts of Foxe Basin (Anders 1966). The year following, the east coast of Baffin Island (Anders, editor, 1967) and the lower Mackenzie region (Bissett 1967) surveys were published. The south coast of Baffin Island (Higgins 1968), north Baffin Island and the Resolute area (Bissett 1968a, 1968b) and the central arctic regions (Villiers 1969) complete the regions covered by the published reports of these area economic surveys. However, Frobisher Bay and Grise Fiord and adjacent areas were also surveyed (in 1966 and 1967 respectively) though the results of these investigations have not, as yet, been published.

The Contents of the Reports

The scope of the reports varied from a slim (32 pages) economic development proposal for Herschel Island (Currie 1964) to a large (520 pages) encyclopedic collection of material on the geography, history, resources, population, economy and settlements of the lower Mackenzie region (Bissett 1967). A typical report, for example, Abrahamson's (1963) survey of the Tuktoyaktuk–Cape Parry region, presented information under the following headings: physical geography, historical background, population of Tuktoyaktuk, Tuktoyaktuk settlement facilities, population of the Parry Peninsula, transportation and communications, capital and employment, and natural resources.

Most of the area economic survey reports ended with specific recommendations for action aimed at improving the living conditions of the Inuit. The studies were not academic ones, aimed at producing "pure knowledge", though some reports did result in the use of innovative concepts or methods of assessing man/land relationships (e.g. Brack and McIntosh 1963; Anders, editor, 1967). The survey officers drew heavily on the research of biologists working in the Arctic, though there is little mention of the work of anthropologists or other social scientists. The reports were intended to provide information and recommendations for aiding development, and moreover, the surveys gathered and presented an enor-

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mous quantity of detailed empirical information on the Inuit way of life in the 1960's. Thus the reports are rich in maps, tables and lists of game takes, harvesting areas for seals, trapping areas, income and employment. The reports also document the extent of contact between the Inuit and the intruders into their territory.

The Necessary Limitations of the Reports

The presentation of statistical information and maps can only be as good as the source information from which they are elaborated. A further limitation, especially in regard to maps or information elicited by questioning or questionnaires, is in regard to the phrasing of the question, or the representative nature of the sample used. Some of the reports draw attention to discrepancies between information provided from different sources: thus the families living in Wager Bay, in 1961, reported to the survey officers a game harvest of 48 foxes, 30 caribou, two white whales, 30–35 seals and unknown quantities of birds and fish, whereas the trader at Repulse Bay recorded 100 foxes traded by the Wager Bay group, and the report opines that the harvest of seals and caribou was likewise higher than reported (Brack 1962: 79); in other reports too, the limitations of the game records are recognized (e.g. Brack and McIntosh 1963: 154; Higgins 1968: 150).

The emphasis, alluded to earlier, in which the observations of biologists predominate in assembling data on renewable resources, can be seen from an analysis of Southampton Island hunting returns, where, in calculating the "food potential" of the game harvest (Brack 1962: Table 13), no consideration has been given to culturally-determined eating habits, such that over-estimates have resulted from assuming all "meat" is "eatable meat". (See Table 1 for a comparison of Brack's estimate of "food potential" with an independent analysis of the same harvest prepared for the Fisheries Research Board of Canada.) Data compared in Table 1 indicate that in terms of strictly biological information, the analyses, for the most part are in fair aggreement, but that in regard to culturally-influenced data, the results show considerable divergence.

The other area where care should be exercised is in regard to maps which purport to show land use for selected communities. Though survey officers doubtless exercised the greatest care in collecting information and checking results before presenting the reports for publication, the objectives to which the surveys were addressed, namely an assessment of *contemporary* issues influencing economic development, must be kept in mind when examining the results. In addition, the years during which the area economic surveys were conducted were often years of progressive abandonment of camp life in favour of a more sedentary life in the developing communities of the north. This situation is made explicit in some of the reports. Thus, accompanying a land utilization map of the Coppermine trading area for the year 1963, the report states:

> With the closing of the post at Read Island in 1962, and the virtual depopulation which followed, some of the area's best fox country lies abandoned . . . In a poor fox year, such as 1962–63, traps will be visited less often or may even be pulled up altogether. (Abrahamson *et al.* 1964: 69)

Further, the same report (*ibid*: 92) makes reference to occasional summer caribou hunting on Banks Island by Holman Island hunters, but the accompanying land use map representing 1963 land use carries no such information (*ibid*: Map 10).

The same limitations apply to maps in other reports. Winter and summer hunting territory maps for Cumberland Sound camps (Anders, editor, 1967: Maps 16 and 17) relate to the activity of the eight camps still in existence at the time of the survey in 1966; however, as the report notes, "as recently as April 1965, there were 12 occupied camps in the Sound area" (*ibid*: 57). The map representing maximum land use for the Banks Islanders (Usher 1966: Map 9) is compiled from data obtained for the years 1962–1965, and makes no claim to represent maximal land use for the community for any more extensive a period of time.

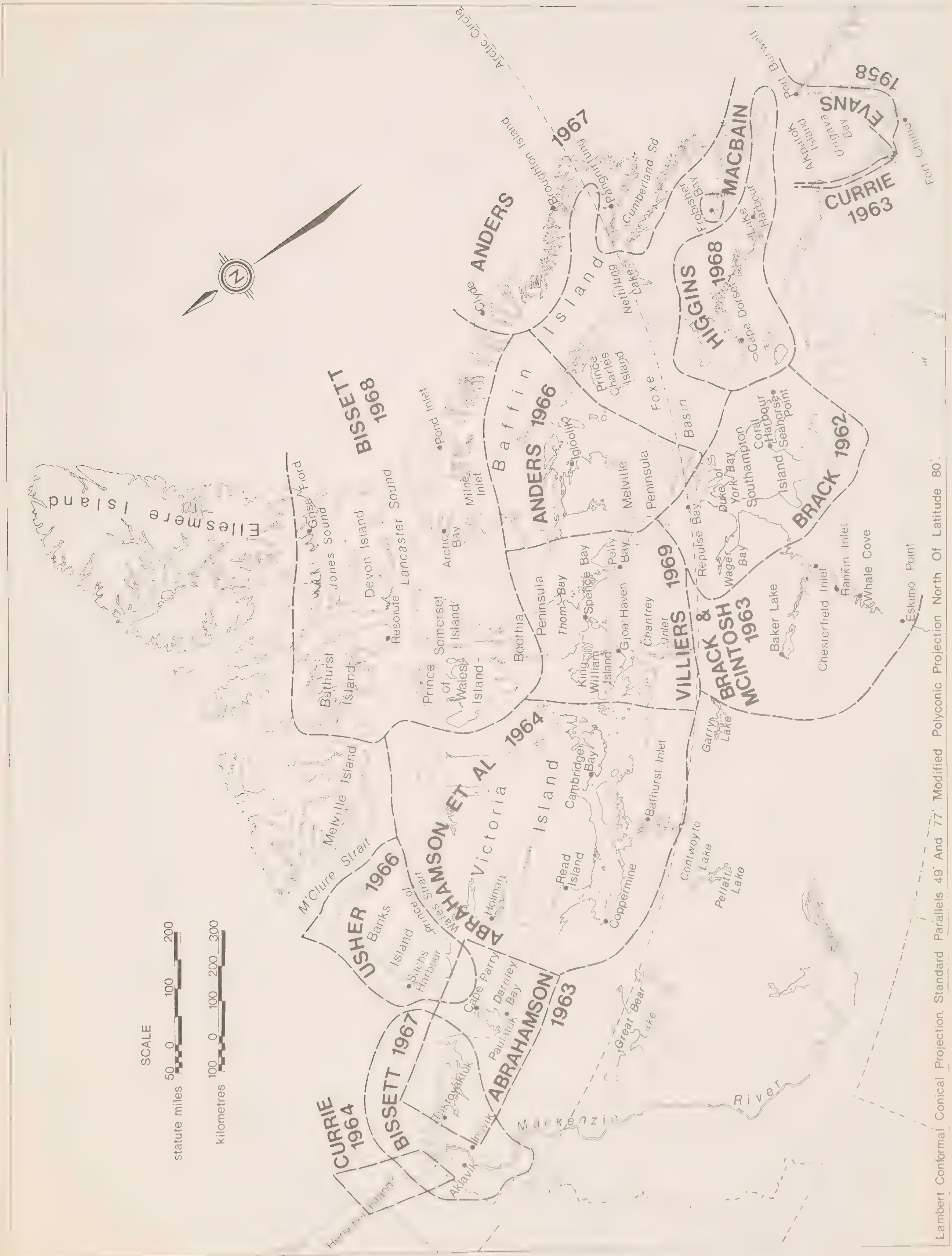
Thus, in summary, it should be noted that the valuable data assembled by these reports probably reflects, accurately, prevailing land use patterns for a restricted period of time only, in accord with the focused objectives of the area economic surveys.

Table 1
Comparison of analyses of Southampton Island marine mammal harvest 1961

	Analysis 1		Analysis 2	
	Total biomass kg.	Human food kg.	Total biomass kg.	Human food kg.
Ringed seal	32,300	8,720	37,400	13,090
Bearded seal	34,875	8,725	44,550	4,455
White whale	16,360	3,765	13,500	1,890
Walrus	128,000	33,280	69,980	5,700
Total	211,535	54,490	165,430	25,135

Sources: Analysis 1 from Brack 1962, Analysis 2 from Freeman 1969/70.

Map 57
Area economic surveys: 1958–1968



The Perspective of the Reports

The area surveys produced snapshots of the life of the Inuit in the mid-1960's. They were snapshots taken with the cameras of southern intruders, who spent a limited time on the surveys, but reported honestly and accurately what they saw. The information gathered was fitted into an economic framework based on the concepts and needs of a southern bureaucracy, charged with "helping the Eskimos". The Inuit perspective is almost entirely missing, except for a few isolated statements recorded in the reports; for example:

> When talking with them (the Inuit of the Repulse Bay – Wager Bay area), one gains the impression that they feel they have few problems and that they are reasonably content to make their living from the country resources. (Brack 1962: 80)

Abrahamson (1964: 158) notes that the Contwoyto Lake Inuit are where they are "by *choice*" and the people "*consider it a good life*" (Abrahamson's emphasis).

At the time the surveys were done, the pulls of the settlement (schools, health services, housing) and the pushes of the land (starvation, disease, uncertainty) were attracting more and more people into the communities. Few of these communities had been located on the basis of the land use patterns of the Inuit.

A number of authors, notably Usher and Abrahamson show an empathy for the Inuit, and a respect for their way of life. But others show a stern, moralistic attitude toward the Inuit. Discussing the "prevailing attitude" of the local Inuit to their material possessions, Anders (1966: 99) describes it as "appalling", and suggests that "it seems most important to try to rectify this attitude before even attempting any development programs".

There is almost no information on the economic and social structures – and the attendant costs – of the non-Inuit residents of the Arctic. The Southampton Island report (Brack 1962: 28) contains a diagram showing White–Inuit interaction, but most reports ignore the presence of any other people than the Inuit. Some reports provide detailed figures of the investment of the various groups in the communities. Thus in Spence Bay in 1967, the federal government capital investment totalled \$1,199,395, the Hudson's Bay Company and the churches had an investment of \$270,000, and the Inuit investment in harvesting equipment and housing totalled \$84,394 (Villiers 1969: 143). At Cape Dorset the same year, government capital investments came to \$2,231,000 and that of the Inuit to \$347,112 (Higgins 1968: 109).

The work of the area survey officers presents something of a paradox, for though it was intended to help the Inuit to make better use of the land resources, continuing government investment in the settlements was drawing more and more people away from the land. It is easier for governments to provide services (education, medical care, housing) to people in settlements; thus, whereas before the 1960's the Inuit depended on the land and the resources, the area surveys chronicled the increasing dependency of these people on the government and the resources of the settlements.

> The settlements at Duke of York Bay, Seahorse Point, and Gibbon's Point have all been abandoned within the last ten years in favour of Coral Harbour area, of places off the Island altogether. The occupants of the Gibbon's Point camp went to Chesterfield. (Brack 1962: 13)

> ... the harvesting of resources by Eskimo groups is becoming more localized due to the increasing settlement orientation of the population. A decline in camps has been precipitated by the development of settlement facilities ... (Bissett 1968: xxi)

> Spring and summer camps appear to have diminished to the point that there are only three of these during the period May to September. ... It also appeared that in this settlement (Pelly Bay) family groups did not go out to winter camps to hunt and trap ... even in summer fishing-sealing camps are on the decline. (Villiers 1969: 123, 137)

Changes in Land Occupancy and Use

All the surveys recorded a marked change in land occupancy and use brought about by the build-up of permanent settlements. Before the mid-1950's, most of the Inuit visited the settlements a few times a year to trade. The first school to be operated by the then Department of Northern Affairs was a former Anglican school, taken over by the government in 1948 at Tuktoyaktuk. The construction of the DEW-Line had a great impact across the Arctic. By the mid-1960's, most of the Inuit were living in permanent settlements, and visiting the land a few times a year. Some were using modern technology (motor toboggans and planes) to combine hunting and trapping with wage employment:

> ... ten years ago the population was largely dispersed across the tundra and along the coasts in small camps containing family groups. Today it is concentrated in seven settlements. In Baker Lake about a dozen families are still camp based, and in Repulse Bay most of the population is camp based in the winter time. (Brack and McIntosh 1963: 14)

> Camps of one, two or more families are scattered throughout the region. The most northerly camp is at Berkely Point, at the entrance to Prince of Wales Strait, while the Pellatt Lake camp lies 350 miles to the south at the other extremity of the region. (Abrahamson *et al.* 1964: 1)

Among the Copper Inuit, Abrahamson notes that those to the east of Coppermine "may still be considered nomadic; a family is camped here today and gone tomorrow" (*ibid*: 41). But he records that elsewhere in the survey area:

> Traps are still set, but lines are shorter and are confined to land around the settlements. This land is heavily trapped while remote areas are neglected. (*ibid*: 34)

The closing of some trading posts in the 1960's had a marked impact on Inuit land use:

> With the closing of the post at Read Island in 1962, and the initial depopulation that followed, some of the area's best fox country was abandoned. (*ibid*: 69)

Abrahamson records, however, that the seasonal rhythm of the Holman people is "still the traditional one of a hunting and trapping society" (*ibid*: 83).

Usher (1966: 11) studying a group of trappers on Banks Island, noted that "virtually all activity has been confined to its southern half" though at Sachs Harbour, no relief had been given for economic reasons, and this form of income had always been less than five percent of the settlement's income (*ibid*: 71).

What appears in several reports makes it obvious that in some areas the limits of resource use were being reached. Though mention is made of some unused resources, e.g. seals at Herschel Island (Currie 1964: 12), char in Cumberland Sound (Anders, editor, 1967: 45), the stress is always on the degree of balance that the Inuit had reached with the natural resources. The Keewatin regional report includes computations of both the caloric requirements of the residents of the area and the caloric value of the food resources available to them from the land (Brack and McIntosh 1963: Tables XV, XVI and Appendix II); the over-population, based on these calculations, was about 380 people. However, due to prevailing rates of natural increase, population would likely increase nearly three-fold by 1972 (*ibid*: 137).

For Banks Island, the area survey concluded:

> The population now appears to be at an optimum level . . . The level of resource utilization is at an optimum. There are no unused resource species of any significance . . . (Usher 1966: 76)

and for southern Baffin Island:

> The data suggest that exploitation has in many ways improved with the abandonment of camps and may, in fact, be approaching a state of near over-exploitation. (Higgins 1968: 188)

Resource Zones and Major Resource Areas

Bissett, in his survey of the Resolute area, developed a useful concept. He identified "resource zones": areas still being intensively hunted and trapped; and "major resource areas": meaning territory that had been hunted and trapped in the past, or in the present, on an occasional or extensive basis. His maps show "normal" and "extreme" resource zones. He states:

> Essentially, the Eskimos are familiar with the coastal zones rather than inland areas except where valley systems and coincident lake and river systems offer a thoroughfare across peninsulas or islands in the winter and summer. (Bissett 1968: 109)

He also noted:

> The Eskimos have applied names to various geographical features within the known hunting zone and these have been recorded on maps . . . (*ibid*: 109)

What emerges from the reports is that the Inuit groups had core areas, and they ranged around these areas. Anders (1966: 34) mentions in passing the "27,000 square miles of land (that are) assumed for the area over which Igloolik Eskimos hunted", but he does not mention how he arrives at the figure. He recorded that:

> Each group of Eskimos had, and in the case of the outlying camps still has, different camp locations for its summer and winter activities and further usually several other choices of sites for each season. (*ibid*: 53)

In the north Baffin Island survey, it is noted that:

> . . . game statistics for the Pond Inlet area indicate some degree of stability in resource harvesting from year to year . . . The resource zone has remained the same during the ten year period as based on interviews with Eskimos . . . (Bissett 1968 a, vol. 2: 1)

and further that the Pond Inlet Inuit "have ceased to make extended inland hunting trips in the summer, or to establish summer caribou hunting camps" (*ibid*: 32).

On the east coast of Baffin Island, the conclusion was that "the location of camp population and the movements of the hunters are basically related to the dynamics of the seal hunt" (Anders, editor, 1967: 64).

Abrahamson (1964: 53) states: "Few of the Parry Eskimos have ever penetrated more than 25 miles into the interior, and are generally ignorant of the country beyond. In the olden days this territory was hunted by Indians from Great Bear Lake." In the Mackenzie Delta region, Bissett (1967: 34) records that "the north-south boundaries between the Eskimo and Indian groups fluctuated according to trading or raiding activities".

There is recognition in the reports that different Inuit groups kept separate from each other: e.g. it is observed for the two groups on Southampton Island that "in spite of over 35 years of contact they have maintained strict separation of kinship" (Brack 1962: 19), and the same separation was noted in the western Arctic (Abrahamson 1963: 32).

There is not much information in the reports on the territories of each Inuit group. Bissett (1968b: 109) notes that the polar bear hunting activities of the Resolute people impinge upon the areas that the Grise Fiord Inuit consider as their own Anders notes (1966: 64) of Qiqiqtadjuk camp that "it constitutes an attempt by a Catholic group to gain better

access to relatively unexploited hunting and fishing grounds considered to be on the whole the preserve of three northern Anglican camps".

Inuit Sentiment Toward the Land

The land still had a strong hold on the Inuit people in 1960's, and a number were still trying to stay on the land:

> It is worth mentioning that the Eskimos themselves have tried the process of relocating in more extensively stocked areas and have gradually abandoned permanent camps in favour of living in large communities. (Villiers 1969: 78)

This central Arctic report cites the Savage Point Relocation Project, in which three families relocated 250 air miles northwest of Spence Bay, on the northeast shore of Prince of Wales Island.

In the Keewatin report is written:

> During the Survey a group of Garry Lake Eskimos expressed dissatisfaction with the state of affairs in Baker Lake. They seemed to recognize that they were in danger of losing much of their sense of purpose in life. They gave the impression that they would like to go back to Garry Lake, but felt that Government did not wish them to do so. (Brack and McIntosh 1963: 101)

and Abrahamson reported of the Coppermine area:

> In the spring of 1963 the tendency to gather in the settlement was reversed when through the encouragement of the Area Administrator, a number of families moved back to hunting and fishing grounds which had lain abandoned for several years. (Abrahamson *et al.* 1964: 42)

and for the Contwoyto Lake people that they "prefer the uncertainties of life on the land to tea and bannock in the communities" (*ibid*: 147).

Some of the reports dealt with a basic dilemma of the Inuit, the reversal of status:

> Sociological and psychological factors of community living at Cambridge Bay inhibit incentive for trapping. The community offers warmth, entertainment, wage employment, and social assistance. In this community, prestige has shifted from the hunter to the permanent wage-earner (albeit the work may be menial) who rents a large comfortable home and can afford the best outboard motors and other material goods. (Abrahamson *et al.* 1964: 136–137)

> At Gjoa Haven and Spence Bay with the availability of wage labour, it becomes difficult to develop a measure by which it is possible to determine accurately at what point a general hunting license holder can be categorized as being predominantly a hunter. At Pelly Bay the procedure is less difficult as prior to 1967 only a minimal amount of wage labour was available. (Villiers 1969: 55)

Hanging over all the reports is the shadow of a basic problem: the resources of the land will support only so many people. There are jobs for only so many people in the settlement (and the best paid and most permanent of these are held by white outsiders). And a generation has grown up that knows neither the life on the land nor the world of steady wage employment.

The situation is succinctly expressed in one report:

> The number of older experienced people, who lived full time on the land, is rapidly declining, and the younger generation cannot be expected to move into a restricted environment and a lower standard of living. (Bissett 1967: 432)

Even for skilled people, returns from the land and the sea are uncertain, despite modern equipment and the help of outside specialists. For example, in the Herschel Island area the summer fishery in 1965 yielded 25,000 pounds of fish valued at $4,000. However in 1966, the fishery yielded only 550 pounds (Bissett 1967: 429).

Non-Renewable Resources and the Land Ownership Question

The area survey reports seldom make reference to non-renewable resources, or to ownership of land and resources. The premise of the reports is that the Inuit people are entitled to hunt and to trap and to fish in the Arctic. Indeed the surveys were carried out to help them to do this better, and more efficiently.

There are only a few mentions of the use of non-renewable resources. The most frequently mentioned mineral is soapstone for making carvings, though local utilization of coal at Darnley Bay is mentioned (Abrahamson 1963: 91). There is a section in the Northern Foxe Basin report (Anders 1966: 99–112) on North Baffin Iron Mines, the implication being that the Inuit will provide the labour force for this mine.

In the survey report for south Baffin Island two paragraphs are devoted to "Lands and Minerals". Land has been leased at Cape Dorset to the Eskimo Cooperative, to the H.B.C. and to the Anglican Church, and "as far as the survey was able to determine, this is the total extent of land leasing in the area and outright ownership does not appear to have been acquired by anyone" (Higgins 1968: 57–58). This report also observes that, "so far the mining of serpentine has taken place without observance of the formalities prescribed under the Canada Mining Regulations", though a footnote adds that after the report was prepared, the West Baffin Eskimo Cooperative filed claims covering some of the serpentine deposits (*ibid*: 149).

The report on the Copper Inuit contains about one page on mineral resources, and records how a group of Inuit

and Whites in 1961–1962 staked 90 claims in the interior. These claims were optioned to Giant Gold Mines for $50,000, and the group received one payment of $5,000. Though the option was subsequently dropped, the author points out that "the syndicate represents the first time, however, that Eskimos have held and benefitted from mineral claims" (Abrahamson *et al*. 1964: 154).

Conclusion

The area economic survey reports usually end with a set of recommendations that vary from the general to the specific. These recommendations stress, for example, boat building or the use of seal nets as a way of helping the Inuit, or they propose programs of adult education. The surveys were undertaken to suggest ways of combatting certain economic and social crises in the Arctic. There appear laments about lack of leadership among the Inuit, but there is little understanding apparent concerning how the world looked from the Inuit perspective. Some recommendations were carried out, others were ignored. In the last survey report published appears the following observation:

> Having deemed it desirable to mould the Eskimo in our social image, an industrialized society may now be experiencing hesitancy and uncertainty, about the whole process of Eskimo acculturation. (Villiers 1969: 171)

Brack, in the Keewatin Mainland survey report noted:

> The people of the Keewatin have not had an easy life in recent years and their future has been clouded by uncertainty and insecurity. The insecurity has largely been dispelled, but the uncertainty remains. (Brack and McIntosh 1964: 125)

The area economic survey reports provide a useful set of base line studies of the way things appear to non-Inuit, in respect to the settlements, and among the Inuit, in the years between 1961 and 1968. They showed these people still hunting, trapping and fishing, and occupying and using many parts of the north.

References

Abrahamson, G.
1963 *Tuktoyaktuk – Cape Parry: An Area Economic Survey*. Department of Northern Affairs and National Resources, Industrial Division. pp. 109.

Abrahamson, G., P. J. Gillespie, D. G. McIntosh, P. J. Usher and H. A. Williamson
1964 *The Copper Eskimos: An Area Economic Survey*. Department of Northern Affairs and National Resources, Industrial Division. pp. 194.

Anders, G.
1966 *Northern Foxe Basin: An Area Economic Survey 1965*. Department of Northern Affairs and National Resources, Industrial Division. pp. 139.

Anders, G. (editor)
1967 *Baffin Island – East Coast: An Area Economic Survey*. Department of Indian Affairs and Northern Development, Industrial Division. pp. 196.

Bissett, Don
1967 *The Lower Mackenzie Region: An Area Economic Survey*. Department of Indian Affairs and Northern Development, Industrial Division. pp. 520.
1968a *North Baffin Island: An Area Economic Survey*. Department of Indian Affairs and Northern Development, Industrial Division. 2 vols. pp. 340.
1968b *Resolute: An Area Economic Survey*. Department of Indian Affairs and Northern Development, Industrial Division. pp. 175.

Brack, D. M.
1962 *Southampton Island: An Area Economic Survey, with Notes on Repulse Bay and Wager Bay*. Department of Northern Affairs and National Resources, Industrial Division. pp. 96.

Brack, D. M. and D. McIntosh
1963 *Keewatin Mainland: Area Economic Survey and Regional Appraisal*. Department of Northern Affairs and National Resources, Industrial Division. pp. 157.

Currie, R. D.
1963 *Western Ungava: An Area Economic Survey*. Department of Northern Affairs and National Resources, Industrial Division.
1964 *The Yukon Territory Littoral: An Economic Development Program*. Department of Northern Affairs and National Resources, Industrial Division. pp. 32.

Evans, Jon
1958 *Ungava Bay: A Resource Survey 1958.* Department of Northern Affairs and National Resources, Industrial Division. pp. 84.

Freeman, Milton M. R.
1969/70 Studies in Maritime Hunting I: Ecologic and Technologic Restraints in Walrus Hunting, Southampton Island, N.W.T. *Folk*, 11–12: 155–171.

Higgins, G. M.
1968 *South Coast – Baffin Island: An Area Economic Survey.* Department of Indian Affairs and Northern Development, Industrial division. pp. 235.

MacBain, S.
(in press) *Frobisher Bay.* Department of Indian Affairs and Northern Development, Industrial Division.

Usher, P. J.
1966 *Banks Island: An Area Economic Survey 1965.* Department of Northern Affairs and National Resources, Industrial Division. pp. 125.

Villiers, D.
1969 *The Central Arctic: An Area Economic Survey.* Department of Indian Affairs and Northern Development, Industrial Division. pp. 189.

An Assessment of the Reliability of Informant Recall

by Eugene Y. Arima*

Introduction

When information on past conditions and events is obtained from informants in those societies which lack a wrritten record of their past, there is always the problem of ascertaining the accuracy of the data obtained. To give credence to the oral information, in the absence of independent confirmation from, for example, written documents in the case of historical information, it is necessary to establish the constancy and reliability of the recall capabilities of the informants.

In ethnology the primary technique of testing informant reliability has been "cross-checking" between a number of informants to see whether or not, independently, they each supply the same information on the given subject of enquiry. This procedure, however, entails a number of problems, one of which is the potentiality for generating misunderstanding and ill-feeling when an individual finds that his information is being held in question, or indeed, that his integrity is being doubted.

Another problem is that cross-checking between informants only establishes consistency of information within the group of people being questioned; it does not establish the congruence of this information with empirical reality, although it does seem likely that agreement between informants increases the probability of such congruence or objective accuracy.

The present essay attempts to evaluate the degree of reliability of Inuit recall in terms of its congruence with external reality and the constancy of such recall over time. Various means of evaluation are available, and two main approaches are used in this report. First I have examined aspects of certain bodies of knowledge, such as language, technology and folklore occurring throughout the great expanse of Inuit territory, examining the amount of commonalty that is to be found and interpreting the evidence in terms of retention over time. Another approach to evaluating recall is to compare recollections of unique historic events with either written records from that time, or with earlier recorded recollections of that event noted by other investigators. The procedures will become clear as they are exercised below.

Language

Many observers have noted the remarkable commonalty in language that exists among the various Inuit groups thousands of miles apart. The Danish ethnologist Knud Rasmussen, who was fluent in Greenlandic, provided an excellent test of this commonalty when he made his great journey from Hudson Bay to Alaska (and even beyond, to the eastern tip of Asia) in 1921–1924 meeting almost all the major Inuit dialect groups – save those in South Alaska, the Aleuts (if they are considered an Inuit people), and the Asian Inuit whom the Russians would not allow him to contact for political reasons. He was able to understand all the groups he encountered without much difficulty, from east to west up to about the vicinity of St. Michael on the Alaska coast not far south of the Bering Strait where a major dialect division occurs. Yet he would probably have been able to master South Alaskan speech in a relatively short time, since it is one of the two sub-divisions of the Inuit language. Aleut would have been another matter for it is considered to be a separate, though related, language. On the other hand, the Asiatic Inuit tongue would have been comprehensible, for it is part of the same great dialect stretching along the arctic sea all the way to Greenland.

It would not be too far-fetched to relate the northern dialect to the archeologically established Thule culture of approximately the first half of the second millenium A.D. This culture, defined necessarily on the basis of artifacts and inferred ecological adaptation, is considered to have developed from the Birnirk culture of about 10th century A.D. in North Alaska, and then have spread east as far as Greenland and west and then south past the Bering Strait. If the comparatively minor differences in speech within the northern dialect of the Inuit language developed in the period of time since the Thule culture differentiated into the historically known groupings known as the Copper, Netsilik, Igloolik, Caribou, South Baffin Island, and Labrador Inuit, then we may say that in respect to language, Inuit recall has shown great retentiveness over several hundred years if it is assumed that mutual influence between the sub-dialects of the groups has been negligible. On the other hand, such a degree of constancy of recall in language over several centuries need not be regarded, in itself, as exceptional for we have only to note the great commonalty between Shakespearian and modern English, particularly in certain parts of North America which have remained isolated from extreme speech styles, such as for example, Cockney. A main difference between commonalty of the English language and the commonalty of the Inuit language, however, is that whereas constancy of the former may derive in part from being anchored in a written tradition, in the case of Inuit, the language is transmitted wholely by oral means.

It is safe to conclude therefore, that in regard to the evidence of language, the Inuit demonstrate good reliability and constancy of recall from generation to generation.

Technology and Exploitative Adaptations

The typical image of the Inuit is cast in technological terms: Inuit live in snow-houses, drive dogsleds, paddle kayaks,

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harpoon sea mammals, wear warm fur clothing with a hooded parka, burn oil in stone lamps for light, heat and cooking. The picture is most appropriate for the central regions of the past century and ignores some major features in Greenland and Alaska which differ from the stereotype: namely permanent houses of stone, turf or logs and the open skin boat, the umiak, both of which also existed in the Canadian Arctic in earlier times. But there is indeed a basic commonalty in technology evident throughout the Inuit domain.

However, there is a problem in evaluating this technologic commonalty in terms of reliability or constancy of recall, in that being technological, it may have been maintained as much in response to common environmental conditions for which the Inuit ecological adaptation throughout is so well suited, as through faithful memory.

Perhaps the best evidence of constancy in technology is to be found in the details of artifacts and techniques where stylistic continuity and local tradition are more determinative of what is preserved, given that basic mechanical requirements can be met by a number of alternative forms and actions. A comparison of the technological inventories of the various Inuit groups, made essentially on the basis of presences and absences of artifact items (as in the work of Birket-Smith 1929: II, for example), really begins to be revealing when formal details are distinguished. Archeologists have been able to infer cultural developments from their meagre materials precisely because they have had to attend to stylistic details. In ethnology the detailed study of technology, including that of the Inuit, has unfortunately been neglected.

However, the writer has some detailed, yet restricted, familiarity with Inuit technology, and will venture to interpret this information in terms of recall reliability for the purposes of this essay.

Kayaks from north Alaska to Greenland share certain similarities in construction such as longitudinal continuous lashings of stringers to ribs and a cockpit hoop which "floats" on the outside of the cover and is tilted up at the front, whereas kayaks from the Bering Strait southward have transverse continuous lashings and level hoops attached to the framework inside the cover. The northern group of kayaks occur in roughly the same geographical area as was occupied by the eastward spreading division of the Thule culture (which preceded the modern Inuit), and also coincides geographically with the territory occupied by the northern Inuit dialect (save at the Bering Strait). There is a particular similarity in end form between the kayaks of the most central Inuit (the Netsilik, Igloolik, and Caribou groups) and that of the Birnirk culture which was ancestral to Thule. It is therefore suggested that the northern group of recent kayaks is derived from the Thule, if not from the Birnirk, kayak. Since the details mentioned, although mechanically efficient, are alternative solutions to kayak requirements, their apparent continuity over several centuries or longer may be taken to provide technological evidence of great constancy in information recall among the Inuit. This constancy does not, of course, rule out the possibility of later innovations, for kayaks would hardly have developed to their high state of local refinement without such means. Nevertheless given that kayaks may date back several thousand years (Arima 1975), the constancy in design is quite remarkable and suggests fidelity in design rather than re-invention following loss of technique.

The so-called "Eskimo violin" – the only native New World stringed instrument – may be cited as another specific technological example of recall reliability. Actually it is not a violin at all but a descendant of the old Norse *fidlu,* most likely introduced into the Hudson Strait region in the late 18th, or early 19th, century by Orkneymen in the employ of the Hudson's Bay Company (Arima and Einarsson Ms). This instrument survived among the Inuit of Quebec and south Baffin Island for about a century after it disappeared in northern Europe; it was still being made by some Inuit in the 1920's. In the late 1950's a very few of these instruments were constructed, and even played, at Povungnituk on the east side of Hudson Bay after very many years of non-use. The reconstructions are much like the "live" artifacts which were collected several decades earlier, and attest to the great reliability of Inuit information recall over individual lifetimes for "traditional" technological items. For accurate recall it seems that the informant must have been more than a small child, i.e. in his or her teen years, when the information was stored in memory. When an old and capable craftsman in Ivuyivik reconstructed an umiak, which he last saw as a boy of perhaps ten or so, he missed a few details so that the resultant craft (made in 1960) could not be deemed accurate (Arima 1963: 57–63).

Folklore

Oral traditions, unlike technological items, are not directly subject to environmental constraint, so that widespread distribution in more or less constant form is likely evidence of long retention. However, the possibility of continuing diffusion across group boundaries must be recognized. The reasoning of Franz Boas, made in relation to collection of the same little song (about the son of a fox and a lemming) from both Cumberland Sound and Hamilton Inlet, is appropriate:

> The Eskimo of Baffin Land and Labrador have intercourse only at the western entrance of Hudson Strait, and there very rarely only. Intercourse between that point and southern Labrador on the one hand, and Cumberland Sound on the other, is indirect only, there being communication from tribe to tribe. The song must have been preserved, therefore, in its old form for a very long time in several parts of a vast district. (Boas 1897: 111–112)

Boas later concluded that the conservatism of the Inuit in their long retention of the same traditions in widely separate regions, between which intercourse ceased centuries ago, was remarkable but quite in accord with their linguistic conservatism (1904: 9). As examples of the latter which, however, also are instances of folklore, he cites the knowledge of animal names in those northern regions where the species in question are absent. For example, in East Baffin Island the grizzly bear, *aglaq,* the ground squirrel, *sigsik,* and the musk-ox, *umingmaq,* were known by name although not present. In west Greenland the wolf, *amaruq,* and lemming, *avingaq,* survive only as monsters in fable, and the Cree Indians, *adlit,* were regarded as a fabulous inland tribe in both Greenland and Baffinland (*loc. cit.*). In Alaska there exists the belief that tremendous beasts, the *kilivvak,* once existed, so strong they could walk through the earth (Ostermann 1952: 152–153); evidence for the *kilivvak* comes from the fossil tusks found in the ground at some localities. A related belief occurs in the central regions (where no tusks are found). Among the Igloolik it is believed that in the ground were large white "eggs" which became giant animals (Rasmussen 1929: 202–203), which does indicate transmission and persistence of recall although, in this case, without exactitude. Among the Netsilik the "eggs" become musk-oxen (Rasmussen 1931a: 265), which probably preserves the idea of the tusks being interpreted as horns, while in Baffin Island tradition, the notion of whiteness appears to have become primary, for the "eggs" become albino seals and caribou (Boas 1964: 232). Comparative data is unfortunately insufficient to establish a west to east gradation in deviation from the Alaskan birthplace of the belief which might suggest that diffusion rather than separate retention was operative. Many qualifications are involved in the interpretation of oral traditions (and indeed, all cultural phenomena) in developmental terms, although the present discussion omits full consideration of these qualifications.

Another illustration of recall capacity is furnished by the following, rather incidental, Netsilik belief:

> Sometimes we see a new sun at the side of the sun (a mock sun). Then we say that the sun is putting its topknot-ribbon on, qilirsuissisartuq; may be the sun wears (her) hair in a topknot. We know nothing about it, nor have we any idea how women can wear their hair in a topknot. But perhaps people used to do it once and we have just forgotten it. (Rasmussen 1931a: 211)

If the last part is faithfully recorded, it shows an awareness that traditional, formalized, recollection may outlive empirically self-conscious "historic" recall. Topknots occur on archeological figures and lasted until recently in Greenland and south Baffin Island. A mid-18th century illustration from the northwest side of Hudson Bay appears to show a topknot (Ellis 1748: 232) so that with the assumption of considerable material cultural commonalty in the region, it may be that the above recollection has persisted no more than two centuries and the loss of historic recall indicates its brevity in this particular instance.

The distribution of narrative traditions among the Inuit (in the references cited at the end of this paper) reveals a great commonalty in the central and eastern areas from Coronation Gulf to Greenland. Major traditions common to this large area include the origin myths of the sea mammals, Indians and Whites, sun and moon, thunder and lightning, fog, narwhal or white whale, and the tales of the hero Kiviuq, the world traveller Atungaq, the orphan Kautjajuk, the cannibal Igimarahugjuk, Navaranaaq who betrayed her people to the Indians, girls who married whales and owls or falcons or eagles, goose wife, fox wife and penis of the lake, to list only the more noteworthy.

Few of the eastern traditions were known in Alaska, including, for example, the raven and marmot (owl and lemming in the east), sun and moon, thunder and lightning, origin of caribou and of fishes (Boas 1907: 364). The western corpus of traditions had a quite different flavour, with many poor boy and rich men stories, a prominence given to warfare, and various origin myths involving the Raven as trickster-creator as occurs in Northwest Coast Indian mythology (cf. Birket-Smith 1953; Bogoras 1913; Golder 1903, 1907, 1909; Jenness 1924; Lantis 1938, 1946; Nelson 1899; Ostermann 1942, 1952; Spencer 1959).

Thus, as in language and technology, in mythology too, a major division occurs into western and eastern sectors, so that if the commonalty of traditions in Canada and Greenland may be derived from a Thule culture base, it might be taken to indicate constancy in recall over several centuries, assuming that intergroup diffusion was quite minimal.

The writer has remarked that storytellers stick by their inherited versions of widespread myths though they may know neighbouring variants.

Recall of Historic Matters

Better than technology or mythology for the assessment of Inuit recall is historic material, first because of the uniqueness of the data, and secondly because of the small likelihood that information will be re-introduced as memory fades. Persistence can readily be evaluated, in numbers of years elapsed, and accuracy by comparing the recollection with the documented record. If recollections of the same set of data can be obtained at different dates, the rate of change in recall might be ascertained.

Recollections by Inuit of earlier visits, by Whites, to their country, particularly those exploratory expeditions which have been historically documented, often show great persistence of memory. A striking example is the recollection of

the 1576–1578 voyages of Martin Frobisher to the great bay bearing his name in southeast Baffin Island, as recorded three centuries later by Charles Hall in 1861–1862 (Hall 1865: 220–221, 226, 244–247, 390, 407–408, 497). Even if the main aged informant was a centenarian, as Hall believed, recall reaches over two centuries. The old informant said that ships came every year: first two, then two or three, then very many, which corresponds to the historic record of two vessels in 1576, three the following year, and 15 the next (*op. cit.*: 247). Inuit tradition said five of themselves were killed while White history stresses the capture of five sailors who landed in a small boat and their probable murders. In Inuit remembrance the five Whites wintered and built a boat with sails on "Kodlunarn" island, using wood left for a house, but in setting off they died from the cold, their hands and feet freezing even before getting out of the bay. This episode occurred on the first voyage in the Countess of Warwick Sound just inside Frobisher Bay; on the named island, Hall found a 100-foot long inclined trench by the water, which he believed to be for shipbuilding (*op. cit.*: 389–391). Inuit tradition did not date the events in years, of course, but associated them with ancestors long dead. They recalled the names of a leader "E-loud-ju-arng" who had been particularly kind to the captured whites, and one "Man-nu" who saw the whites (*op. cit.*: 497). Also the first whites who came were said to have erected a monument in Newton's Fiord which was respectfully propitiated with gifts for good hunting. That and other physical evidence of the Frobisher voyages, like the remains of attempts at mining, and bricks, tiles and rusted iron pieces at various sites, may have contributed to the maintenance of the oral tradition, which, nonetheless, remains a remarkable instance of longlived and detailed recall with accuracy attested with regard to the number and spacing of voyages and numbers of ships and of captured men.

Recollection of historic events within a century's span, or one generation removed from actual observation, has been illustrated by Rasmussen's recording, in 1923, of Netsilik memory of 19th century Arctic expeditions to their region (1931a: 27–29, 129–131). Referring to John Ross's arrival in Lord Mayor Bay, on the east side of the Boothia Isthmus in 1829, he wrote: "The Arviligjuarmiut still had many recollections of their first meeting with white men, and the sober manner in which they told of these experiences, now almost a hundred years old, is good evidence of how reliable the Eskimo can be as narrators if only they have to do with people that understand them" (*op. cit.*: 27). The name of the first man to see the ship was recalled as Aviluktuq, and James Ross, second-in-command of the expedition, had been called "Agluugkaq" ("he who takes the long strides") for he always seemed to be in a hurry; several of the Arviligjuarmiut of Pelly Bay who had become most closely associated with the expedition were also remembered by name (*op. cit.*: 28).

Recollection of the last Franklin expedition of 1847–1848 is very interesting since only the Inuit record survives, of course. An old man told Rasmussen of his father's encounter with three thin expedition members dragging sleds on the west side of King William Island; this informant mentioned the names of all five couples at the Inuit spring camp involved (*op. cit.*: 129). The Inuit encounter with the dead ship in the ice off northwest King William Island, and a ship's boat on Adelaide Peninsula with six bodies was recounted in a "peculiar and droll way", Rasmussen noted. "They themselves did not attach great importance to the sadness of the doom of the white men; instead they emphasized the old Eskimo's knowledge of the white men's things and sought to get what fun they could out of them" (*op. cit.*: 130). It is to be expected, of course, that as history became legend an entertaining story would be developed (see appendix).

Other white visits of the period were also well remembered: Rae in 1847 and 1854, Hall in 1864, Schwatka in 1879; and of these recollections Rasmussen comments:

> I must admit there is nothing particularly exciting about these experiences, but perhaps just because of that they provide good testimony of the good memories and trustworthiness of the Eskimos. These encounters with white men have been quite *en passant,* and there has not been time to learn to know the people they mention in the slightest; and yet so many, many years afterwards they preserve the traditions of their experiences with unembellished and sober reliability. (1931a: 29)

Knud Rasmussen himself has become a figure of Inuit history with people still living who were young when Kunuk, as he was called, traversed the Arctic half a century ago. So remarkable was he that it is little wonder that the way he appeared in each locality is recalled in considerable detail, particularly in aspects which were significant to the Inuit, for example, his Greenlandic speech (which sounded child-like to the Canadian groups), his admirable travelling skills, his Polar Inuit companions who are recalled by name and characteristics. Other Danes of the Fifth Thule Expedition recalled at Igloolik are Birket-Smith as "Qaqugluk", the petrel, so named for his bespectacled face, and Mathiassen as "Tikilik", the arriver, for he would always be walking on the land while the rest travelled by the sea and consequently would arrive later into camp (David Damas, pers. comm.).

Recall of Inuit Matters

If Inuit recall of white history is impressive, it may be expected to be still better for matters of more concern to themselves. In a rare study, Guy Mary-Rousselière (1969) has compared two recollections, by a mother and daughter in 1923

and 1968 respectively, of the starvation of a camp in north Baffin Island in 1904–1905. The daughter was about 10 years old when they came upon a woman, Ataguttaaluk, who had survived by cannibalism. The accounts, recorded 45 years apart, 18 and 64 years after the event, agree on all essentials. In addition it is noted that the later recollection by Atuat, ". . . by far the longest . . . is by no means inferior to her mother's, on account of the precision of details" (*op. cit.*: 18). Atuat even recalled the names of their four dogs (*op. cit.*: 9, 22). Of 38 points roughly distinguishable in the later version, 22 are new, while the earlier account gives about 29 points of which 23 are repeated later. The shortness of the mother's account, which in itself is detailed enough, may be mainly a result of Rasmussen having had to note it from memory (1929: 29–32), whereas Mary-Rousselière used a tape recorder. In addition the latter was certainly much more intent upon recording every recallable detail. The very low incidence of contradiction occurring between the two versions may have resulted from Rasmussen's record being made from memory (Mary-Rousselière 1969: 14, 15). All in all, however, the two accounts are essentially identical and demonstrate the reliability and fullness of recall that is possible from Inuit eyewitnesses to significant events.

In the mid-19th century people migrated to the Thule district in northwest Greenland from north Baffin Island, and again Rasmussen recorded the recollection of it in Greenland (in 1903–1904), including the names of 33 individuals who made the journey to Greenland (1908: 23–34). Robert Petersen (1962) has been able to add much more detail to Rasmussen's account, by utilizing an early written record (from 1865) and information recorded in 1952 and 1957 from informants in Canada.

The definitive study of this historic migration is not yet completed, however, for Mary-Rousselière will soon add further clarification, having questioned informants and discovered that a second unsuccessful migration attempt in the 1890's has complicated recall. He writes: ". . . since they were related to the first group, many had the same names, and this brought confusion when, later, Canadian Eskimos asked the Polar Eskimos about their relatives, the latter thought that they were talking about members of the first group" (pers. comm. 1975).

One reason for later accounts of Inuit affairs adding details and clarifying matters may be contained in Petersen's remarks on the development of Inuit traditions:

> The Eskimo narrative tradition seems to be subject to the same rules that apply to myth formation everywhere. So long as the story is so new that some relatives can feel affected by it a certain adjustment to the story is made, some points are toned down, others emphasized. The final version is that which the family desires posterity to hear. The uniform story that has spread over large areas can first make its appearance several generations after the incidents related have taken place, in order that none of the narrators can feel affected by the course of the tale. (1962: 108)

His generalization appears apt for affairs involving conflicts, suffering, and even death, as in the mid-19th century migration to Greenland. More emotionally neutral matters may be expected to be told about with disinterest from the outset, as in recollections of passing white explorers.

Genealogies can be recorded from recollections quite faithfully and fully, and afford another glimpse into the nature of Inuit recall, for Rasmussen, in his listing of individuals by household in his journey of 1921–1924, has left a documented base line against which recent recollections can be compared. For example, among the Caribou Inuit almost half a century later in 1968, the writer found that a couple of old people recalled virtually all of the 91 Qairnirmiut band members listed by Rasmussen, over 90 per cent of the 74 Harvaqtuurmiut and two-thirds of the 107 Paadlirmiut of the winter of 1921–1922 (Rasmussen 1930a: 11–13, 22–23, 37–38). Still more may have been recalled, but under names different from those listed earlier. The Paadlirmiut were not recalled as fully as the other two major bands only because at Baker Lake, where the information was gathered, there were no old and knowledgeable Paadlirmiut. Though Rasmussen had recorded just the primary family ties within each household, more extensive linkages could be remembered in 1968. That older Inuit can remember almost all band members several decades later, including the various interrelationships existing between individuals (see Guemple, p. 181) should not be too surprising, for they were largely related close or distant through blood or marriage, and, most important, comprised a community in a sparsely populated world. Nevertheless, the excellent recollection of the individuals listed by Rasmussen for the groups from Hudson Bay to Coronation Gulf, as elicited by Damas (1963, 1969) and others, empirically confirms the reliability of Inuit recall within at least a lifetime.

Conclusion

From the foregoing examples it would seem that Inuit recall is highly reliable (with due allowance made for cultural selectivity in what is recollected) within living memory from young adulthood at least, i.e. for about half a century. Recall is still reliable at a generation's remove or about a century after the event, but with some loss of original content to be expected and the beginnings of formalization into legendary narrative becoming apparent. After about two or three centuries content has become quite fragmentary. Insofar as the surviving main points are now preserved in tradition, continued reliability exists.

Dating is possible, in terms of generations, as far as the grandparental perhaps. Names of Inuit individuals who were

involved can be well remembered even for the past generation, for they may be relatives, while a few particularly notable personages might be named over many generations' time.

It is only the extraordinary happening that is recollected with historical particularism over generations, and the characteristics of recall evidenced for special events may not apply to that of the more commonplace. But what the Inuit choose to remember, they remember well over at least two generations.

Appendix

(Netsilik recollection of Franklin's ship as recorded by Rasmussen in 1923 [1931a: 130–131])

For the sake of brevity I will omit all the Eskimo names; for as usual Qaqortingneq wanted to prove his trustworthiness by mentioning all the persons by names.

"Two brothers were once out sealing northwest of Qeqertaq (King William's Land). It was in spring, at the time when the snow melts away round the breathing holes of the seals. Far out on the ice they saw something black, a large black mass that could be no animal. They looked more closely and found that it was a great ship. They ran home at once and told their fellow-villagers of it, and next day they all went out to it. They saw nobody, the ship was deserted, and so they made up their minds to plunder it of everything they could get hold of. But none of them had ever met white men, and they had no idea what all the things they saw could be used for.

"One man, who saw a boat hanging up over the gunwale, shouted: 'A trough, a gigantic trough! I am going to have that!' He had never seen a boat* and so he thought it was a meat trough. He cut through the lines that held the boat, and it crashed down on to the ice bottom upward and was smashed.

"They found guns in the ship, too, and as they had no suspicion of what they were, they knocked the steel barrels off and hammered them out for harpoons. In fact, so ignorant were they about guns that they said a quantity of percussion camps they found were little thimbles, and they really thought that among the white men there lived a dwarf people who could use them.

"At first they dared not go down into the ship itself, but soon they became bolder and even ventured into the houses that were under the deck. There they found many dead men lying in their beds. At last they also risked going down into the enormous room in the middle of the ship. It was dark there. But soon they found tools and would make a hole in order to let light in. And the foolish people, not understanding white man's things, hewed a hole just on the water-line so that the water poured in and the ship sank. And it went to the bottom with all the valuable things, of which they barely rescued any.

"The same year, well into spring, three men were on their way from King William's Land to Adelaide Peninsula to hunt for caribou calves. There they found a boat with the bodies of six men. In the boat were guns, knives and some provisions, showing that they had perished of sickness.

"There are several places in our country where we still see bones of these white men. I myself have been at Qavdlunasior-

*There were no umiaqs in the region; only kayaks.

fik, a point on Adelaide Peninsula, almost opposite the place where Amundsen wintered; up to only a few years ago we used to go over there to dig for lead and pieces of iron. And there is Kangerarfigdluk quite close to us, a little way along the coast towards the west.

"That is all I know about the pelrartut as we call the white men who once visited our country and who were lost without our forefathers being able to help them."

One day in the late fall, just before the ice formed, I sailed with Peter Norberg and Qaqortingneq up to Qavdlunasiorfik on the east coast of Adelaide Peninsula. There, exactly where the Eskimos had indicated, we found a number of human bones that undoubtedly were the mortal remains of members of the Franklin Expedition. Some pieces of cloth and stumps of leather we found at the same place showed that they were of white men. Now, almost 80 years after, wild beasts had scattered the white, sun-bleached bones out over the peninsula . . .

References

Arima, E. Y.
1963 Report on an Eskimo umiak built at Ivuyivik, P.Q. in the summer of 1960. *National Museum of Canada Bulletin* 189, Anthropological Series no. 59. Ottawa.
1975 A contextual study of the Caribou Eskimo kayak. National Museum of Man, Mercury Series Publications in Ethnology, no. 25. Ottawa.
Arima, E. Y., and Magnus Einarsson
(Ms.) When and whence the "Eskimo fiddle"? (To be published in *Folk,* Copenhagen.)
Birket-Smith, Kaj
1929 The Caribou Eskimos, I–II, material and social life and their cultural position. *Report of the Fifth Thule Expedition 1921–24,* V. Copenhagen.
1953 The Chugach Eskimo. *Nationalmuseets Skrifter Etnografisk Raekke,* VI. Copenhagen.

Boas, Franz
1894 Eskimo tales and songs. *Journal of American Folk-Lore,* 7: 45–50. Boston and New York.
1897 Eskimo tales and songs. *Journal of American Folk-Lore,* 10: 109–115. Boston and New York.
1904 Eskimo tales and songs. *Journal of American Folk-Lore,* 17: 1–13. Boston and New York.
1907 The Eskimo of Baffin Land and Hudson Bay. *American Museum of Natural History Bulletin,* XV. New York.
1964 *The Central Eskimo.* Bison Books paperback reprint. University of Nebraska, Lincoln. (Original published 1888. *Bureau of American Ethnology, Sixth Annual Report, 1884–85.* pp. 399–699. Washington.)

Boas, Franz, and Henrik J. Rink
1889 Eskimo tales and songs. *Journal of American Folk-Lore,* 2: 123–131. Boston and New York.

Bogoras, Waldemar
1913 The Eskimo of Siberia [Jesup North Pacific Expedition, VIII (3)]. *American Museum of Natural History Memoir,* 12: 417–456. New York.

Damas, David
1963 Igluligmiut kinship and local groupings: a structural approach. *National Museum of Canada Bulletin* 196, Anthropological Series no. 64. Ottawa.
1969 Characteristics of Central Eskimo band structure. In, *Band Societies,* David Damas (editor), *National Museums of Canada Bulletin* 228, Anthropological Series no. 84. pp. 116–138. Ottawa.

Ellis, Henry
1748 *A voyage to Hudson's Bay by the Dobb's Galley and*

California in the years 1746 and 1747. London. (Reprinted 1967. Johnson Reprint, New York.)

Golder, F. A.
1903 Tales from Kodiak Island. *Journal of American Folk-Lore,* 16: 16–31, 85–103. Boston and New York.
1907 A Kodiak Island story. *Journal of American Folk-Lore,* 20: 296–299. Boston and New York.
1909 Eskimo and Aleut stories. *Journal of American Folk-Lore,* 22: 10–24. Boston and New York.

Hall, Charles F.
1865 *Life with the Esquimaux.* London. (Reprinted 1970 Hurtig, Edmonton.)

Hawkes, E. W.
1916 The Labrador Eskimo. *Geological Survey of Canada Memoir* 91, Anthropological Series no. 14. Ottawa.

Holtved, Erik
1951 The Polar Eskimos, language and folklore. *Meddelelser om Gronland,* 152 (1 & 2). Copenhagen.

Jenness, Diamond
1924 Eskimo folk-lore. Part A: Myths and traditions from Northern Alaska, the Mackenzie Delta and Coronation Gulf. *Report of the Canadian Arctic Expedition 1913–18,* XIII. Ottawa.

Kroeber, A. L.
1899b Tales of the Smith Sound Eskimos. *Journal of American Folk-Lore,* 51: 123–172. Boston and New York.

Lantis, Margaret
1938 The mythology of Kodiak Island, Alaska. *Journal of American Folk-Lore,* 51: 123–172. Boston and New York.
1946 The social culture of the Nunivak Eskimo. *Transactions of the American Philosophical Society,* 35 (3): 152–323. Philadelphia.

Mary-Rousselière, Guy, O.M.I.
1969 History of a case of cannibalism in Baffin Land. *Eskimo,* 81: 6–23. Churchill.

Nelson, E. W.
1899 The Eskimo about Bering Strait. *Bureau of American Ethnology, 18th Annual Report,* part 1. Washington.

Nungak, Zebedee, and E. Y. Arima
1969 Eskimo stories from Povungnituk, Quebec, illustrated in soapstone carvings. *National Museums of Canada Bulletin* 235, Anthropological Series no. 90. Ottawa.

Ostermann, H.
1942 (Editor). The Mackenzie Eskimo, after Knud Rasmussen's posthumous notes. *Report of the Fifth Thule Expedition 1921–24,* X (2). Copenhagen.
1952 The Alaskan Eskimos, as described in the posthumous notes of Dr. Knud Rasmussen. *Report of the Fifth Thule Expedition 1921–24,* X (3). Copenhagen.

Petersen, Robert
1962 The last Eskimo immigration into Greenland. *Folk,* 4: 94–110. Copenhagen.

Rasmussen, Knud
1929 Intellectual culture of the Iglulik Eskimos. *Report of the Fifth Thule Expedition 1921–24,* VII (1). Copenhagen.
1930a Observations on the intellectual culture of the Caribou Eskimos. *Report of the Fifth Thule Expedition 1921–24,* VII (2). Copenhagen.
1930b Iglulik and Caribou Eskimo texts. *Report of the Fifth Thule Expedition 1921–24,* VII (3). Copenhagen.
1931a The Netsilik Eskimos, social life and spiritual culture. *Report of the Fifth Thule Expedition 1921–24,* VIII (1). Copenhagen.
1931b The Utkuhikjalingmiut. *Report of the Fifth Thule Expedition 1921–24,* VIII (2). Copenhagen.
1932 Intellectual culture of the Copper Eskimos. *Report of the Fifth Thule Expedition 1921–24,* IX. Copenhagen.

Rink, Henrik J.
1885 *Tales and traditions of the Eskimo.* Edinburgh and London.

Schultz-Lorentzen, C. W.
1928 Intellectual culture of the Greenlanders. In *Greenland,* M. Vahl *et al.* (editors), vol. II: 209–270. Copenhagen and London.

Spencer, Robert F.
1959 The North Alaskan Eskimo; A study in ecology and society. *Bureau of American Ethnology, Bulletin,* 171. Washington. (Reprinted 1969. Smithsonian Institution Press.)

Thalbitzer, William
1923 The Ammassalik Eskimo, II. Language and folklore. *Meddelelser om Gronland,* 40. Copenhagen.

Turner, Lucien M.
1894 Ethnology of the Ungava District, Hudson Bay Territory. *Bureau of American Ethnology, Eleventh Annual Report, 1889–90.* Washington.

Inuit Maps from the Canadian Eastern Arctic*

by John Spink and D. W. Moodie

Introduction

This study attempts to analyze maps of the Canadian Arctic drawn by Eskimo. As the examples used were taken from published works they concern areas and bands located in the more intensively investigated Arctic, east of Coronation Gulf. However, characteristics of Alaskan and Greenlandic native mapping have also been considered where relevant. Most of the maps examined were produced by groups occupying coastal locations, while the few available examples by inland bands come from the Caribou Eskimo of Keewatin District. The distinction between maps produced by inland and coastal bands was made because the groups differ in cartographic representation, and it is not intended to imply an economic division. General statements in the study apply to both sets of charts, while differences are examined in the section on "Content and Style".

Although even institutions like the Encyclopaedia Britannica comment on the accuracy of the Eskimo maps, no work has been discovered which analyzes Eskimo maps from the Canadian eastern Arctic. As a consequence this study has entailed the first collection of as many published copies of charts as were available. It is the belief of the authors that few printed maps have escaped their attention, although this complacency should be tempered by the possible existence of unpublished charts in various artifact collections.

The study is divided into sections dealing with the various qualities of Eskimo map drawing. An attempt is made to suggest reasons for specific Eskimo cartographic characteristics, including the native ability to draw reasonably accurate maps of vast areas of Arctic terrain. In each of these sections the published works of both coastal and inland bands are examined.

A basic problem in the study was deciding what constituted an "Eskimo map". The qualification that it should be the work of an untutored native with a minimum of direction from the non-aboriginal collector was fairly easily enforced, since infringements were generally reported in the accompanying accounts and appear non-native in design. There were, however, varying degrees of occidental influence in the eastern Arctic where many of the examples of native mapping were produced. Apart from the Eskimos' obscure links with the Greenland colonists or Vinland voyagers, they were subject to increasing inroads from western whaling fleets from 17th century onwards. The plentitude of maps collected in the Canadian eastern Arctic illustrates the amount of contact with investigating officers and scientists who visited that area from the first decades of the 19th century. Some subjectivity must be introduced in deciding on the aboriginal quality of the works, particularly the later examples, but the characteristics of the well authenticated "primitive" maps provide clear guidelines.

Media

The body of charts can be divided into two main sections: first those drawn by Eskimo for the education of other Eskimo, and secondly those done by Eskimo for the use and enlightenment of white men. The latter were usually drawn at the insistence of Europeans in general, and anthropologists in particular. The two types of maps have differing aims and were generally fashioned from different media.

The maps produced by Inuit (as Eskimo style themselves) for others of their group are the more "primitive" and "unsophisticated" in execution and are usually the more ephemeral. They consist of simple representations of areas visited or known by the artist and were created for the instruction of his fellow Eskimo. Such maps were usually drawn in outline upon sand or snow, using a stick or fragment of bone to mark the surface of the medium. Boas writes:

> As their knowledge of all the directions is very detailed and they are skilled draftsmen they can draw very good charts. If a man intends to visit a country little known to him, he has a map drawn in the snow by some one well acquainted there and these maps are so good that every point can be recognized. Their way of drawing is first to mark some points the relative position of which are well known. (1888: 643–644)

The application is elucidated by Spencer, who comments:

> The maps were used when travel directions and instructions were given from one person to another. If a man were about to travel to an area which he had not previously visited, he made a point of discussing his plans with another who had been there. The latter would then draw a map in the sand or snow and explain the most desirable travel route and the natural landmarks which were of aid in finding one's way. The map was thus drawn during the course of explanation. (1955: 46)

In certain cases this drawing technique was elaborated upon and some attempt was made to produce a relief model by indicating topographic features, not merely by linework, but also by the use of piles of sand, snow and stones to represent mountains, ridges and valleys. Historical evidence of such activity is forthcoming from Huish's account of the travels of Captain Beechey along the coast of Bering Strait in 1826, when the following incident took place:

> On the first visit to this party, they constructed a chart of the coast upon the sand, of which, however, Captain Beechey at first took very little notice. They, however,

*Edited excerpt from the monograph first published in 1972, entitled *Eskimo Maps from the Canadian Eastern Arctic* by John Spink and D. W. Moodie. Monograph no. 5, Cartographica, York University, Toronto.

> renewed their labour and performed their work upon the sandy beach in a very ingenious and intelligible manner. The coast line was first marked out with a stick, and the distances regulated by the day's journey. The hills and ranges of mountains were next shown by elevations of sand or stone, and the islands represented by heaps of pebbles, their proportions being duly attended to. As the work proceeded, some of the bystanders occasionally suggested alterations, and Captain Beechey removed one of the Diomede Islands, which was misplaced. This was at first objected to by the hydrographer, but one of the party recollecting that the islands were seen in one from Cape Prince of Wales, confirmed its new position and made the mistake quite evident to the others, who were much surprised that Captain Beechey should have any knowledge of the subject. When the mountains and islands were erected, the villages and fishing stations were marked by a number of sticks placed upright, in imitation of those, which are put up on the coast, wherever these people fix their abode. In time, a complete hydrographical plan was drawn from Point Darby to Cape Krusenstern. (1836: 397)

A more modern account of such relief mapping in the western Arctic is provided in Spencer's article, wherein he comments that the narrator would pile snow or sand in ridges to indicate the surface features of the tundra, would hollow out sections for lakes, and would smooth out beach and ocean areas. Further, he would draw in the water courses and lakes and show some care in designating portages (Spencer 1955: 46). Obviously, such chartings and models were not intended to serve as portable navigation aids in the sense of a "portolan" chart. They were representations of environmental knowledge of an area unknown to the observer, who presumably attempted to remember the image produced before him, and to assimilate its details and impact into his navigational skills.

Because of the impermanence of most of their media, the study of charts designed for use by other Eskimo is limited to investigating early accounts of Inuit communicating their special knowledge to their fellows.

Other maps (over 50 of which have been published), though they form the bulk of the surviving Eskimo representations of their environment, must be approached with caution for they were produced by selected individuals for representatives of a strange culture. In some of the maps the particular Eskimo may have attempted to reproduce his own environment in terms of the mode of representation suggested to him by the outsider. Certainly in terms of media, the use of pencil, charcoal, or ink upon parchment and paper was foreign to the Eskimo. But leaving this divergence aside, the line drawings which were produced, in many cases when the "primitive" was little influenced by the collector, cannot have been so dissimilar from the line drawings in wood, sand and snow. The only extraneous influence which may have been introduced was perhaps the promptings of the strangers toward the elaboration of particular sections of coastline, and the presence of western charts which the Inuit were sometimes shown and asked to improve upon. The presence of published charts cannot be held to be too inhibiting, however, if the drawing of spatial representations is accepted as being a pre-existing aspect of Eskimo culture.

Content and Style

An Eskimo's best cartography is likely to be centred upon an area he knows well. The significance of various foci can generally be deduced from the manner in which they are enlarged in comparison to less well known localities. Of equal significance are the features which are represented and the manner in which they are portrayed. All are natural features: rivers, lakes, coastlines, cliffs or mountains. There is no attempt made to represent in pictographic form any human activities or settlements. The only non-natural features are the routes of travel which appear on some maps. Occasionally the villages or nightly camp-sites on such routes are indicated, though these are never represented by anything more elaborate than a dot or cross. The charts remain simple because of their restricted purpose. Except when drawn at the instigation of outsiders, they were not produced as attempts at complete delineation of a section of country, but were intended to indicate routes through areas not known by the stranger. As a consequence of this orientation, not all the territorial knowledge possessed by the Eskimo was presented, but only those landscape features which could aid navigation. This in part accounts for the austere nature of the whole body of chartings. Both inland and coastal bands used maps to indicate routes. The differing focus of attention between these two sets of charts results in general from the different landscape features which each used as primary aids in navigation.

The charts drawn on paper use simple linework to portray the natural features used as landmarks along route-ways. The coastal bands devote most attention to an accurate delineation of the coastline which is represented by a single unbroken line. As the charts serve as a "coastal waters pilot", the coastline is represented in considerable detail. Complete illustration of its intricacies of form is more important than any exactitude in either bearing or distance, for the coast was generally closely followed by this truly littoral people. Although some of the coastal charts delineate interior sections of peninsulas and islands, most aim to convey an essentially littoral representation.

In these various ways the coastal charts reflect the significance of the coastline in the lives of the maritime bands. Knowledge is the crucial factor in all these areal representations. The coastline is emphasized because it generally provides the easiest travelling routes in both summer and winter. As a consequence the narrow littoral is best known and

best drawn, and accurate delineation only extends as far inland as the routes allow. This factor explains the poor representation afforded rivers in these charts. The only ones shown are those whose valleys are followed by portages across headlands and peninsulas, and for the others only their estuaries are shown, principally as an aid to seaborne navigation.

This lack of attention to riverine elements is in no way reflected in the charts from the inland Eskimo. Their environment is accurately represented in their attempts to depict the Barren Grounds, which Rasmussen (1930: 26) described as: ". . . a net of small watercourses which wound their way between large and small lakes and made it difficult to keep the set course. The very gneiss hills resembled each other . . ." A monotonous landscape of few distinct features or unique reference points, and as such it is presented in the published maps. The rivers are clearly the most important element in dividing the land, and consequently form the cartographic reference points. Their nature is also adequately presented. The extent of lakes, shallows and rapids were mapped in a way which fits Birket-Smith's description of this hydrographic system with the Kazan River represented as: ". . . a genuine Barren Grounds river, with large broads connected by short, swift channels". (1933: 115)

Though the Caribou (Eskimo) maps are often of a slightly larger scale than those of the coastal dwellers, any differences in symbolization are due more to their differing subject matter than to the slightly more restricted scale of movements of the former group of map makers. Rivers, in particular, stand out in the inland works, taking the place of importance assumed by the coastline on the maps of the coastal bands. Such is their parallel importance in the life of the inland Eskimo. The rivers, like the coasts of the maritimers, serve as hunting grounds, as constant reference points, as aids and obstacles to travel, and form part of the dichotomy between aquatic and terrestrial sections of the environment. On the inland maps they are often represented by double lines, while the coastal Eskimo always present rivers as a single line. This variation graphically illustrates the different approaches to this particular facet of the environment and its utilization.

The inland Eskimo are more intimately aware of the rivers; they serve as broad obstacles in time of flood. Their tendency to limit movement is emphasized inland where there can be no recourse to the sea for travelling. The coastal Eskimo uses his rivers as reference points for aiding movement in coastal waters, hence the single line indicates their position rather than their utility or width. Inland, the exaggerations and use of double lines for symbolizing rivers result partly from the hunting technique and the settlement patterns of the Caribou Eskimo. The fact that caribou are hunted, often from kayaks but sometimes from ravines in the banks, as they cross the rivers on their annual migrations, lends the deer crossing points a significance only rivalled elsewhere by the best hunting grounds along the coasts. The gathering of the deer and their subsequent slaughter provides the focus for distortion in maps: crossing points are particularly emphasized, and the stretches of river on which the kills generally take place are lengthened and broadened when represented, as well as being given a general east-west trend because of the importance to both men and deer, of the rivers which lie directly across the path of the migrating caribou:

> It is the wanderings of the caribou that principally determine the distribution of the settlements. The big caribou crossing places act like magnets on the population. This brings the west-to-east parts of the river courses into prominence, because they lie across the path of the caribou trek, as is shown by the crossing places on the lower Kazan River, which are vital to the existence of the Harvaqtormiut. (Birket-Smith 1929: 72)

Thus, in both the maps of the Caribou and coastal Eskimo, simple linework is used to portray the significant natural features. Generally, an unbroken line is used to represent coastline or river bank, and this is backed in appropriate places by hachuring to denote the presence of cliffs or mountains sides. The representation of relief is absent from many of the maps but its occasional presence is significant in so far as it records another variable facet of the landscape important for navigation.

In some of the maps attempts are made to more accurately depict the intricacies of relief by varying both the length of the hachure strokes and their direction. In maps of the mountain and fiord country along the east coast of Baffin Island, the hachuring employed corresponds in large measure with reality.

The Caribou Eskimo inhabit an area of much greater relief, probably the flattest and most monotonous part of the Canadian Shield. The terrain is rolling and even, with more drift cover and fewer outcrops of bedrock than is common on the Shield. Consequently relief representation is much less prominent on their charts, though it occurs on almost all of the maps. Attempts are made to represent isolated hills with a simple form of hachure-work and some are indicated by means of single dot. On a few of the charts more extensive "ranges" are symbolized by masses of jagged and confused scribbling. This may be due to a lack of detailed knowledge of the features or a lack of interest in them. The features may also be thought of as barriers to movement, and certainly their representation suggests that this is so. But much of this relief is too slight to be represented on the surveyed map and so can hardly form an extensive barrier. Probably the scribbling is an attempt at portraying slight relief. The symbolism used in the Caribou (Eskimo) maps is not particularly complex in any respect, portraying rivers, lakes and hills in a manner in no way as sophisticated as that used in some of the coastal works. This contrast is reflected in many other aspects of their cultures.

Few of the maps produced by either inland or coastal bands are detailed. The coastal works use a single line to represent coastline and achieve a fair degree of accuracy. The inland bands attempt a simple delineation of rivers by linework with less measure of success. The use of a single line is appropriate since, in all the charts it marks the border between known and unknown territory over wide areas delineated by the Eskimo. The inland Eskimo represents hydrographic features and the more noticeable characteristics of landform shapes. The coastal Eskimo were familiar with the seaward aspect of much of the Arctic territory and hence their maps show an awareness of indentations, cliffs and islands, with portages across blustery headlands magnified as a consequence of the hardship and delay encountered in crossing them.

The maps existed purely as practical guides and do not seem to have become stylized. Compared with more scientific map making the Eskimo charts appear bare and unprepossessing. They consist of simple, unadorned and accurate linework, and the absence of colour, despite its availability, makes them seem drab.

Generally the charts were drawn, as befits their practical base, from the home port or camp in the usual direction of travel, the cartographer merely choosing a convenient alignment to suit the restrictions of his medium. A good exemple of this approach can be found in Parry's account of the work done by a female cartographer who:

> . . . continued the outline, making the land trend as we supposed to the northeastward, and giving the names of the principal places as she proceeded. The scale being large, it was necessary when she came to the end of one piece of paper to tack on another, till at length she had filled ten or twelve sheets, and had completely lost sight of Winter Island at the other end of the table. (1824, II: 197)

The free expression implicit in such charting allowed the artist to sketch his view of the environment or route in a natural manner, and thus he was freed from the inhibitions attending the artificial restraints encountered in regular cartography. The draughtsman could present a complete picture of his territory, complementing his drawing with verbal instructions, descriptions and advice.

Mapping Proficiency

The published examples of Eskimo cartography display a phenomenal amount of accurate spatial representation and locational awareness for works created by pre-literate people. The generally outstanding quality of the published works probably reflects selectivity on the part of various authors in reproducing only those maps which were judged to be superior. Even so, the available examples indicate that these supposed "primitives", or at least certain members of the groups, were able to envisage and produce reasonably accurate outlines of the lands known by them without the need for any training or the use of survey instruments. Certainly the anthropologists and explorers who first commented upon this particular skill were convinced that some of the Inuit possessed a greater degree of this faculty than others of their race, and consequently the number of artists engaged to draw maps was not particularly large. (The reports total about 50 accounts of different Eskimo drawing maps, though not all these works have been published.) The differences in quality among the various maps may reveal some of the bases of Eskimo cartographic skill.

Among traditional, non-western peoples, map drawing is frequently limited to select elements of the population, like navigators or tribal chiefs, who possess both the knowledge and the requisite social approval to enable them to produce images of their part of the world. No such restrictions seem evident in Eskimo society, where all ages and both sexes have attempted mapping. The results have varied greatly in accuracy, but the best products seem dependent only upon the drawing ability and intelligence of the artist. Of course, certain men were pointed out to the early explorers as being well travelled and good hydrographers, but among these mobile people in a harsh land the delineation of territory could not be shrouded in the mystique given to it in some other areas. Maps have been produced by all those old enough to recall travelling, and some of the best small scale charts were produced by women. Spencer states that in Alaska only men drew charts (1955: 47). If this is correct it can only be a local tradition, for farther east many of the best maps were proudly drawn by women. Iligliuk drew charts for Parry at Winter Island in 1822 (1824, II: 185), another female, Tiriksui, drew one for Ross during his second voyage (1835: 261), while another old lady ". . . 'conned' the *Fox* up Pond's Inlet as if she had been a certified pilot from the Trinity House . . ." (Markham 1875: 184). Several other instances are reported of female draughtsmanship and in every case the final product has received high praise, often presenting, as in Ross' example, greater knowledge than that represented by her male compatriots. There were thus no social sanctions against women "showing off" some of their environmental knowledge. The presence of women in the body of cartographers is important since their skills and awareness could not have been acquired solely during the hunt. They must have developed largely upon seasonal movements for trade or new camp sites.

The numerous accounts of Eskimo travelling abilities and the examples in map form of their extensive territorial knowledge clearly reveal their basic environmental awareness. The Inuit are generally predisposed toward accurate cartography for they are aided by a ready perception of local features, coupled with an extensive knowledge and awareness of their surroundings. Some of the maps which have been

used in this work were compiled by the map makers taking sightings of directions and territorial relationships from high ground. Such "surveying" was a part of Eskimo life, as elevated observation was practised during hunting expeditions both to reconnoitre the ground and spy out game.

Certainly some draughting skill must have been required to produce the maps, as well as an awareness of the environment in two-dimensional terms. Not all the navigation experts could use the drawing medium either. Parry provides one example, the native Toolemak.

> He and his companions came on board the *Fury*, when I employed him for a couple of hours in drawing a chart of the strait. Toolemak, though a sensible and intelligent man, we soon found to be no draughtsman, so that his performance in this way, if taken alone, was not a very intelligible delineation of the coast. By dint however of a great deal of talking on his part, and some exercise of patience on ours, we at length obtained a copious verbal illustration of his sketch . . . (1824, II: 303)

Despite such individuals there is a generally pervasive feature of accuracy about the cartographic works. A characteristic of the mapping is the rarity of mistaking sections of coasts for islands, and islands for peninsulas, an aspect which caused the European explorers much more difficulty. Although the outline of the coasts, or of rivers, is not always correct in its bearing or its relative proportion, the distinctive features of the landscape are accurately recorded. As Stefansson wrote: "They are more likely to have the right number of curves in a river and the right shape of the curves than the proper distance scale" (1938: 8). The accuracy of presentation can only have resulted, among the coastal people, from local knowledge gained in navigation at ice-free seasons and from sledding on sea ice in winter.

Another advantage possessed by native cartographers was an awareness of local physical aids to orientation, and hence indirectly to mapping. They were much more aware of the physical features which could be used for direction finding, particularly inland, and used them frequently in travelling across what appeared to outsiders as a monotonous white landscape. The snow itself was an aid, for the ice crystals aligned themselves according to the direction of the fairly constant prevailing wind. Freuchen writes of using these "'sastrugi', snow crystals on the ice which the wind arranged in stripes pointing in its direction. Since the southwest is by far the dominant wind in all of western Greenland, it was no problem finding one's direction when sastrugi were present". (1961: 51)

Even glacial action lent itself to direction finding, for in Labrador, where three-fourths of the more elevated regions are bare rock, Turner writes: "The northern extremity of all the ridges and spurs indicate that the glacial sheet moved to the north-northwest, for these portions of the rocks are so jagged and sharp edged as to appear to have been broken out but yesterday" (1894: 169). Thus the paths of the ice sheets with their resultant striae form a direction indicator, even on bare rock, over considerable expanses of terrain.

The more vegetated areas provide other clues for orientation. Though the tundra is treeless and appears undifferentiated over vast stretches, yet it differs markedly from place to place. One of the unique features of Arctic vegetation is its extreme variability from one small area to the next, its micro-habitats. These can have an influence as direction aids, for there is ". . . a virtual absence of higher plants and the abundance of persistent snow patches on north facing slopes". (Polunin 1960: 381)

Another locational aid presents a general picture of the environment almost in map form. This is the phenomenon of sky reflection, when the clouds mirror the underlying surface of ice or water. Stefansson indicates its usefulness.

> When clouds of a uniform color hang low there is reflected in them a map of the earth below them. Snow-free land and open water are shown in black on the clouds; the pure white sea ice appears in white, and land covered with snow soiled by blown sand, etc., is reflected darker than the sea but lighter than snowless land. This sky map is of the greatest use to sledge travellers always, and especially in crossing wide bays from headland to headland; where the landmarks themselves are below the horizon, their position is accurately indicated by their reflection in the clouds. (1962: 298)

The sky-map was encountered by all the early explorers, many of whom found it a considerable aid to navigation.

The expert Eskimo navigator achieves a synthesis of these, and other directional stimuli provided by his environment, and is so proficient at such orientation that it becomes almost second nature to him.

> Travelling in their own country they almost unconsciously absorb innumerable impressions which serve to guide them. The white man who is not so accustomed to noticing these small differences in the appearance of a monotonous undulating tundra or the direction of the drift of snow over the ice, seems to be witnessing the functioning of a sixth sense, but can of course train himself to do the same. (Birket-Smith 1959: 49)

The fact that the Eskimo are nomads encourages and accentuates awareness of location. They are travellers in a harsh environment where survival depends very largely upon ability to find shelter or food. Everyday life continued under this regime of vital landfalls, when either camps, food caches, or points of resource like sea bird nesting cliffs, were essential to continued existence. Movement placed the individual in a precarious and exposed position when orientation to landmarks assumed a very real importance. To some extent the environment was an aid to the Eskimo. In addition to the directional clues recounted earlier, he lived in a stark landscape which was only recently deglaciated. The severe and uncompromising landforms of many areas were distinctive

enough to be memorable and were rapidly assimilated into his navigational skills, forming vital locational impulses which served to orient moving people. Where these distinctive landforms were not present, piles of stones were built and these dot the otherwise monotony of areas like the Barren Grounds. The presence of a distinctive landscape has further impact as most of the native movements took place within a prescribed area, that of the territory traversed in seasonal hunting.

More distant travel was also somewhat prescribed, for the seasonal traffic in order to trade usually followed traditional routes. Families often covered vast distances to obtain simple necessities like soapstone, driftwood or copper, when these were not available in the home area. The actual amount of trade has perhaps been underestimated for there was a considerable intercourse between the different groups across the entire Arctic (Birket-Smith 1945: 10, 1959: 147; Jenness 1922: 19; Spencer 1959: 198). As a consequence of this trade, sections of coast became known by the repetition of encountering the same succession of features, season after season. Small wonder that one of Hall's Aivilik informants could sketch the coast from the Churchill River to Lancaster Sound, a range of nearly 1,000 miles. Constant repetition was not strictly necessary for adequate cartography. Once attuned to registering the location of particular features and being aware of the vital necessity of knowing one's orientation at all times, cartographic and verbal descriptions could be given for areas visited once, or only occasionally.

The Eskimo were trained from childhood to acquire an extended knowledge of their country and learned while accompanying their parents on their seasonal trips. Relying for navigation on memory alone, ". . . they must be observant and carefully mark the surroundings from all the views afforded. The faculty of memory is thus cultivated to an astonishing degree, and seldom fails, even in the most severe weather, to insure safety for the individual" (Turner 1894: 202). With necessity for precise navigation so impressed upon them, the recalling of travel routes for others intending to journey in similar directions presented few difficulties for experienced travellers. Perhaps it was the impact of distinctive landform features and the awareness of a need for ready orientation which played a more important role in the graphic representation of navigational skills than the mere repetition of familiar landscape features.

With so few native maps consigned to any lasting medium the faculty of memory needed to be cultivated. An advantage in remembering details from the more remarkable facets of the landscape was the Eskimo love of place names. The presence of distinctive landforms meant that there was an extensive topographic nomenclature. Virtually every feature had its own place name and spirit. They were thus individual for particular reasons and hence all the more memorable and useful as navigation guides and reference points. Eskimo have long demonstrated an obsession with names, for these give identity to persons and objects. They attempted to learn the names of the early exploring parties and knew the names of many of the whaling skippers and crews. The landscape of any area, even those parts not intensively settled, carried a fairly extensive set of place names.

Most bands had their own name systems, which were known locally, and were given to features for historic reasons or descriptive purposes.

Within the local area the topographic names were useful for navigational purposes. Rasmussen described the Caribou (Eskimo) names as being, ". . . as a rule characteristic and informative names, the result being that to one who was familiar with these names it was not so difficult to find the way" (1930: 26).

The facility for naming was useful in the development of cartographic ability among the Inuit. The names became focal points in the organized directional schema made available to the individual.

The basis of Eskimo navigational skills lie within the areas of human response to environmental stimuli. Naming and mapping are the end products of such a reaction. The Arctic landscape provides a plentitude of notable features and these were fixed in the memory by the custom of naming and by mapping. The good mapping carried out by women and adolescents indicates that locational knowledge and awareness was not particularly restricted, but was diffused through all who shared the nomadic life. Though good hunters and experienced travellers were generally expert at mapping (Mathiassen 1928: 97), the knowledge did not come solely from hunting expeditions, but partly from family movement across the desolate landscape where orientation was a constant necessity and where all landmarks assumed a vital importance.

Conclusion

Eskimo maps communicate only part of the territorial knowledge of the Inuit. They are simple and unadorned drawings which seek to represent sufficiently memorable features of landscape as to make a route navigable by one who has never journeyed that way before. The maps possess unique characteristics of scale, content and style, and were executed upon distinctive media prior to the coming of the Europeans. Although deficient as pleasing charts, they serve as practical accompaniments to an extremely colourful and diverting verbal account. The stories implicit in most of the place names and the appropriate naming of landforms in Arctic territory reveal the maps to be merely part of the process of communicating territorial knowledge.

The maps are generally limited to portraying areas which were visited by the draughtsman, but such a restriction does not impose a severe handicap on the amount of territory which

can be represented. The widespread use of mapping among the Eskimo reflects not only their territorial knowledge, but also the frequency of travelling. Their great mobility in part explains why they are prepared to accept cartography when more sedentary peoples are not prepared for its inherent quick diminishing of distance. Cartography is apparently an indigenous element of Eskimo culture, and perhaps even an essential adjunct to the nomadic way of life.

References

Boas, Franz
1888 The Central Eskimo. *Bureau of American Ethnology, Sixth Annual Report.* Washington.

Birket-Smith, Kaj
1929 The Caribou Eskimos: material and social life and their cultural position. *Report of the Fifth Thule Expedition,* v (1). Copenhagen.
1933 Geographical notes on the Barren Grounds. *Report of the Fifth Thule Expedition,* I (4). Copenhagen.
1945 Ethnographical collections from the Northwest Passage. *Report of the Fifth Thule Expedition,* VI (2). Copenhagen.
1959 *The Eskimos.* London.

Freuchen, Peter
1961 *Book of the Eskimos.* New York.

Huish, Robert
1836 *A narrative of the voyages and travels of Captain Beechey . . . to the Pacific and Behring's Straits; performed in the years 1825, 26, 27 and 28.* London.

Jenness, D.
1922 The life of the Copper Eskimos. *Report of the Canadian Arctic Expedition,* XII. Ottawa.

Markham C. R.
1875 Papers on the Greenland Eskimos. In, *A selection of papers on Arctic geography and ethnology.* London.

Mathiassen, T.
1928 Material culture of the Iglulik Eskimos. *Report of the Fifth Thule Expedition,* VI (1). Copenhagen.

Parry, W. E.
1824 *Journal of a second voyage for the discovery of a Northwest Passage from the Atlantic to the Pacific; performed in the years 1821–22–23, in His Majesty's ships Fury and Hecla.* London.

Polunin, N.
1960 *Introduction to plant geography and some related sciences.* New York.

Rasmussen, Knud
1930 Intellectual culture of the Caribou Eskimos. *Report of the Fifth Thule Expedition,* VII (2). Copenhagen.

Ross, John
1835 *Narrative of a second voyage in search of a North-west Passage.* London.

Spencer, R. F.
1955 Map making of the North Alaskan Eskimo. *Proceedings of the Minnesota Academy of Science,* XXIII: 46–49.
1959 The North Alaskan Eskimos: a study in ecology and society. *Bureau of American Ethnology, Bulletin,* 171. Washington.

Stefansson, V.
1938 In *General Cartography,* E. Raisz (editor). New York.
1962 *My life with the Eskimo.* New York.

Turner, L. M.
1894 Ethnology of the Ungava District, Hudson Bay Territory. *Bureau of American Ethnology, Eleventh Annual Report.* Washington.

Fieldwork Methodology: Rationale and Assessment

Introduction

Two working years were allotted to the task of making a full and explicit statement concerning Inuit land use and occupancy in the Northwest Territories of Canada. To be sure, several months preceding this were spent thinking and talking about the work to be done, but until funds became available in September 1973 the only work that could be started was in some of the five communities in the western Arctic. For the remainder of the Northwest Territories the two years was allocated as follows:

Recruitment and start-up stage	3 months
Fieldwork	6 months
Write-up	5 months
Verification/amendments	3 months
Map draughting	6 months
Editing reports; final report writing	4 months

Insofar as certain of these tasks could proceed concurrently the sum is greater than two years. However, a good deal of selection in the establishment of work priorities has been necessary throughout, and efforts to "standardize" procedures so as to facilitate the eventual compilation of a unified report has caused some loss of detail and caused early decisions to eliminate certain types of data collection. For example, the reader looking for information on how many walruses or caribou have been killed at any particular location will not find it in these reports. Our focus is necessarily "geographical", in the sense of territorial. We seek to say in what way a certain piece of land was used by the local people. We do not attempt to determine whether that piece of land yielded a certain number of animals in a certain number of years, nor do we attempt a qualitative assessment of perceived "usefulness" of that piece of land. To answer the question, "how important is location A", would require defining "important" to the mutual satisfaction of all our fieldworkers (about 150 in number) and in a way seen as equally reasonable to our respondents (about 1,600 in number). Given that no research has yet been done to allow any standardization of environmental perception criteria among the Inuit, we could only attempt that degree of refinement in our interviewing after a pilot research project had allowed establishment of uniform sets of criteria. For example, is "important" assessed in terms of the proportion of the total food supplied by that animal, and if so, is it expressed in caloric value, or money-equivalent value, or of satisfaction units, or of essential amino-acids? Then even if one agrees that "important" means something similar to everyone in regard to walruses, say, how does one evaluate the trade-off that results from the fact that when walruses arrive in an area the ringed seals almost invariably leave? Thus for the benefit imparted by walruses, there are disbenefits when another staple resource moves away. Obviously, qualitative assessments need to be unequivocal in nature before we could use them. For this reason we have chosen a simple yet potentially precise set of criteria in our land use mapping, namely: presence or absence.

If a piece of land has been used for a given land use activity we so record it. If it has not, no record appears.

In the sections that follow an assessment is made of the degree to which the potential for accuracy is achieved. Elsewhere in this Volume, the potential for subsequent analysis of our data, collected with attention to this level of discrimination, is explored further (see chapter by Philbrick p. 61).

Personnel

Ideally a project such as this would utilize local people to the maximum extent possible. A second requirement would be to recruit people with past experience in similar or related lines of work involving interviewing and systematic data recording.

In practice, constraints of time and other considerations prevented prior recruitment and training of northern personnel for all positions. Instead, teams made up of local and non-local personnel were constituted in each community, with the latter responsible for production of a report on the land use of each community (or region) with which they were associated.

Thus a total of 20 non-local and about 120 local people worked on data gathering in each of 33 northern settlements during the period July 1973 through September 1974. On average, about 10 weeks were spent in any one community for the purpose of data collection, though in some communities the work was completed in as little as three weeks.

Fieldwork

At the time fieldwork commenced few communities, outside of the western Arctic, had prior information or understanding of the land use and occupancy study. Fieldworkers were required to communicate to councils and the community at large the purposes of the study and to seek advice and other assistance on how best to proceed locally. In some cases general meetings were held, at the call of the local council, or in other situations meetings of councils were used as a vehicle to introduce the fieldwork phase of the study. Written material was prepared for distribution in some communities (appendix I) and subsequently local radio, bulletin boards and council meetings were variously employed to keep people informed.

However, as the basis of the study was the personal interview conducted usually in an individual's own home, informal contacts resulted in project personnel becoming known

Table 2
Interview coverage in sample western and eastern Arctic communities

Community	Total number of interviews possible	Interview conducted	
		Number	Percentage
Western Arctic			
Aklavik	68	51	75%
Inuvik	89	63	71
Paulatuk	17	15	88
Sachs Harbour	21	20	96
Tuktoyaktuk	79	73	92
Eastern Arctic			
Arctic Bay	60	46	77
Hall Beach	45	59	82
Igloolik	85	72	82
Pond Inlet	73	59	81
Resolute Bay	33	30	91

locally within the community. As several interviews might be conducted each day, the project was soon known to the majority of people.

Fieldworkers reported that the response in the communities to the study was largely favourable. And, as time went on, understanding and enthusiasm for the project began to grow quite rapidly. Once its broad purposes and scale were understood, many persons took a real interest in it, and were eager to ensure that data were both comprehensive and accurate. Maps were drawn in enthusiastic detail, and ecological and cultural data, which were accumulated over time, were repeatedly checked, revised and improved.

The positive response to the project was probably as much a measure of the inherent interest in the data being collected as the increasing concern being shown by people in the north toward the future of their society, culture and environment.

The response rate in communities was high: the goal, to interview every hunter alive today was inevitably not reached. Some people were away from home at the time the fieldwork was carried out in their communities; others were in ill-health, pre-occupied or, in a very few cases, not willing to be interviewed. In any case where it occurred, a person's reluctance to be interviewed was fully respected. However, in all communities a large majority of those eligible were in fact interviewed, thus there is no reason to believe the few people not interviewed would have changed the results obtained in any significant fashion.

Table 2 indicates the level of response from 10 sample communities.

Eligibility of Informants and Data

In most cases criteria for inclusion were unambiguous: the respondent had to be of Inuit parentage, or similarly acceptable as a member of the community.

In a very few cases, probably numbering no more than four or five, non-Inuit, either born in the north (usually with an Inuk mother) or of long time residence, were urged by the community to provide land use data on the grounds of being *bona fide* members of that community. Those of mixed Inuk-white origin were included in the sample regardless of whether the father or mother had been Inuk. Those of mixed Inuk-Indian origin were included only if the father was Inuk, on the assumption that those persons with Indian fathers would subsequently be included in the N.W.T. Indian Brotherhood's land use survey.* The definition of Inuk (plural: Inuit) in this study is without prejudice to any future definitions which may be devised to establish eligibility in the event of a land claims settlement. The selection was made solely from the point of view of obtaining information from those persons most qualified to provide it on Inuit land use and occupancy. The land use maps, then, are based on the personal activities of living hunters and trappers, starting from that time when the individual was old enough to hunt and trap on his own (as opposed to his birth date,** for example). Formerly this occurred between the ages of perhaps 12 to 16 years, more recently somewhat later, since it usually coincides with whenever the individual left school. There was no attempt to gather information about the father's land use patterns, as the objective was to obtain biographical data on living people.

Furthermore the definition of the land use excludes activities resulted in hunting, fishing or camping which occurred during employment with some external agency, whether it be oil or mineral exploration on one hand, or distant fishing ventures sponsored by government agency on the other. Despite these various restrictions, however, the scope of the study virtually included every male head of household, some of their older sons, and a few widows who have for some time supported their families by hunting and trapping.

In view of the high degree of interaction that generally occurs within each study region, and the low incidence of

*This applied to Aklavik and Inuvik only. There are two families in Tuktoyaktuk in which the father is all or part Indian; as these men are locally regarded as integral members of the native community without distinction, and in any event the N.W.T. Indian Brotherhood does not intend to include Tuktoyaktuk in its survey, these men were included in this study.

**In many cases data were collected on camp locations an individual had occupied, starting from the one at the individual's birthplace.

movement of people across the regional "boundaries", it was decided to gather only those data which related to the region itself. Hence, for example, for those few western Arctic people who had spent a few years in other regions, the fact was simply noted without marking their land use on maps of these other regions. Similarly, for those few central or eastern Arctic people now living in the west, their land use prior to their arrival in the west was not marked on maps.

The Map Biography

The basis of this study is the map biography: a map compiled by each hunter interviewed showing the areas he had hunted, trapped, fished and camped during his adult life.

In each case, information was obtained for certain, standard categories of land use: for example, white whale hunting, polar bear hunting, or trapping (see Table 3 for complete list of categories). A further separation of the data was in regard to discrete time periods (see following).

Although answers were sought in regard to pre-determined categories of land use, every effort was made to ensure that individual interviews were as informal and open-ended as possible. Thus additional information on local history, legends and place names, animal behaviour, or information of a personal nature was often volunteered during the interview and in many cases recorded. Some of the data have been incorporated into other map series,* or is on file as part of the archive assembled in connection with this study.

Time Period

During the past half century great changes have occurred in the Canadian north. Settlements have been established, abandoned, or relocated, and different economic forces have, at various times, been paramount. Land use patterns will change in relation to such events, and part of the variability in land use, from community to community and region to region, resides in the individual variations including the ones occurring within any individual's own life time.

Because a great deal of variation in land use behaviour is either local or idiosyncratic, the most valid way to organize variations through time is by selecting blocks of time of sufficient temporal extent so as to illustrate (a) changes having longer-term significance – rather than short term fluctuation – and/or (b) of widespread synchronic occurrence, thus enabling the Arctic region as a whole to be so categorized in a valid and uniform fashion.

*In addition to land use maps, the project has assembled map series depicting cultural data, campsites, place names, core hunting areas and wildlife resources ("ecological" maps).

Table 3
Land use categories used in map biographies

Land use type	
Undefined	
Berries	
Arctic hare	Rabbit
Bear, brown	
Bear, grizzly	
Bear, polar	
Beaver	
Beluga (white whale)	
Campsite	
Caribou	Barren Ground; woodland; Peary
Duck	Eider; old squaw; merganser; pintail; etc.
Fish, freshwater	Char; trout; whitefish; grayling; pike; ciscoe
Fish, marine	Cod; capelin sculpin; halibut; shark; etc.
Goose	Canada; blue and snow (waveys); Brant; etc.
Moose	
Musk-ox	
Muskrat	
Narwhal	
Ptarmigan	
Sea bird	Gull; dovekie; guillemot; murre; fulmar
Seal, bearded	Square flipper (seal)
Seal, harbour	Ranger seal
Seal, harp	Greenland seal; saddleback seal
Seal, ringed	Silver jar; fiord seal; common seal
Shellfish	Mussel; clam; sea urchin
Trap line	Fox; martin; mink
Walrus	
Whale, bowhead	Greenland whale
Whale, white (beluga)	
Wolf	
Wolverine	
Other mammal species	Mountain sheep; squirrel; weasel; hooded (bladdernose) seal
Other birds & bird eggs	Swan; loon; owl; crane; eggs of *all* species

Thus for the most part three time periods have been recognized.

Period I
The years prior to the local arrival of traders.

Period II
The fur trade period: the years from the local (or near local) establishment of a fur trade post till the years when trapping for fur-bearers was replaced for most people, as the mainstay of the local economy, by the wage-earning opportunities of DEW-Line and other government construction programs.

Period III
The period of growth of permanent settlements in the north, during which time schools and health facilities became established and many people abandoned permanent camps on the land to live in the new administrative centres.
In a very few cases a Period IV was recognized, due to some significant local event during the Period III block of time. Table 4 indicates the actual years corresponding to these time periods in each of the northern communities studied. The years constituting each time period vary locally, as they constitute blocks of "social time" rather than chronological time.

Scale of Maps

It was decided at the outset of the project to use the N.T.S. topographic sheets at a scale of 1:500,000 (about eight miles to the inch). This decision commended itself largely because that scale appears to be the most familiar to the trappers and hunters. This scale was also convenient to use when interviewing men who have travelled throughout an entire region. The use of maps at any larger scale would have required carrying enormous quantities of maps house to house, as well as the difficulty in spreading them all out in the confined space of a kitchen table or floor. Most important was that the 1:500,000 scale maps proved to be both of sufficient size and of sufficient detail that people were able very readily to plot their information, particularly of trap lines, following major topographic features and areal use. The exception was the Mackenzie Delta itself, where 1:250,000 maps were used, due to the complexity and intricacy of the Delta channels and lakes, as well as the more compact pattern of land use in that area. Even at this scale, many trappers noted that the lack of detailed representation of every lake and creek prevented them from drawing their trap lines with complete accuracy. On maps at a scale of 1:50,000 some trappers could easily trace their trap lines to an accuracy of within 50 yards.

Spatial Representation of Data

The land use data obtained in this study are of three types: they are represented on maps by points, lines or areas. The points are essentially limited to settlements or camps.* The linear and areal data require some further explanation.

Since at least 1920, the dominant pattern in tundra and coast trapping over most of the Canadian Arctic has been the running of distinct trap lines. The trapper sets out from the winter camp along a given route, perhaps along the coast or up a river valley, setting traps periodically (usually at regular intervals) along the way. Hence trapping activity can generally be represented as a series of lines on a map that depict the routes used for trapping. What is commonly known as a trap line is thus a conceptualization of points in space joined together by the travel route between them. In most communities some old men indicated that trapping activity in their earlier years occurred throughout an area rather than along lines, and it is indicated as such on the maps. This is because in those years, the winter camp was more liable to be moved short distances, and also traps were set around camps and along a variety of trails used for other activities.

The situation in the Mackenzie Delta and on the Barren Grounds west of Hudson Bay is somewhat different. In the Delta many people run fine fur trap lines, which are sometimes complex and circuitous, since they follow lakes and channels. Some trappers were willing and able to point out in exact detail where their lines ran. Others indicated a general line, or an area. Muskrat trapping (and shooting), however, occurs over a series of lakes within an area, hence this activity is more accurately portrayed in areal rather than linear terms. In particular, even though a muskrat trapper can trace a line, on a map, which he follows regularly, and which links up all the lakes and creeks he uses, on any individual lake he will set traps wherever there are muskrat push-ups. In that sense he does not select points for his traps but covers an area within which traps are set. The same is true of muskrat trapping in the Tuktoyaktuk area.

On the Barren Grounds west of Hudson Bay, the inland groups of Inuit rarely used the relatively large number of traps that were commonly used by many men living in the coastal regions. Trapping inland was less intensively pursued by most during the winter months, and was closely associated with caching of caribou meat close to the winter settlement areas (see chapter by Hoffman, p. 69). The frequent movement of a few traps throughout a restricted area surrounding a camping or hunting location was more reasonably represented on maps as areas than as lines, though in some cases both might be shown.

*Camps were required to have been used continuously for a period of about a month, or to have been periodically re-occupied (perhaps on a seasonal basis) over several years in order to qualify for inclusion on the map biography.

Table 4
Years included in each time period

Community	Period I	Period II	Period III	Period IV
Aklavik	Pre-1929	1929–1955	1955–1974	
Arctic Bay		Pre-1959	1959–1974	
Baker Lake	Pre-1916	1916–1956	1956–1974	
Bathurst Inlet	Pre-1920	1920–1954	1954–1974	
Belcher Islands	Pre-1930	1930–1960	1960–1974	
Broughton Island	Pre-1927	1927–1955	1955–1974	
Cambridge Bay	Pre-1920	1920–1954	1954–1974	
Cape Dorset	Pre-1913	1913–1960	1960–1974	
Chesterfield	Pre-1912	1912–1954	1954–1974	
Clyde River	Pre-1923	1923–1954	1954–1974	
Coppermine	Pre-1916	1916–1955	1955–1974	
Eskimo Point	Pre-1924	1924–1959	1959–1974	
Frobisher Bay	Pre-1925	1925–1955	1955–1974	
Gjoa Haven	Pre-1926	1927–1954	1955–1962	1963–1974
Grise Fiord			1953–1974	
Hall Beach	Pre-1935	1935–1965	1965–1974	
Holman Island	Pre-1923	1923–1939	1939–1965	1965–1974
Igloolik	Pre-1930	1930–1965	1965–1974	
Inuvik**	Pre-1929	1929–1955	1955–1974	
Lake Harbour	Pre-1930	1930–1964	1965–1974	
Pangnirtung	Pre-1928	1928–1962	1962–1974	
Paulatuk	Pre-1935	1935–1959	1959–1974	
Pelly Bay	Pre-1935	1935–1967	1967–1974	
Pond Inlet		Pre-1959	1959–1974	
Port Burwell		Pre-1959	1959–1974	
Rankin Inlet*		Pre-R.I.	1956–1971	
Repulse Bay		Pre-1962	1963–1974	
Resolute Bay		Pre-1960	1960–1974	
Sachs Harbour		1928–1961	1962–1974	
Southampton Island	Pre-1925	1925–1962	1962–1974	
Spence Bay	Pre-1948	1949–1962	1963–1974	
Tuktoyaktuk	Pre-1929	1929–1955	1955–1974	
Whale Cove*		Pre-W.C.	1959–1974	
Yukon-Delta**	Pre-1929	1929–1955	1955–1974	

These communities were constituted only in Period III; respondents' earlier land use activity refers to that in their prior place of residence.
*Residents in Inuvik and Aklavik generally had earlier land use in the Mackenzie Delta and Yukon coastal area; thus time periods for these communities correspond, even though Inuvik was only constituted as a community during Period III.

Every other type of hunting activity can be portrayed in areal form. Here a comment is in order on the nature of hunting ranges on the tundra and the sea ice for wide-ranging species, especially caribou, polar bears and seals. On the sea ice, the floe edge or major cracks or leads are the most promising hunting areas for bears and seals, as well as (along with major pressure ridges) the major travel barriers. The location of these phenomena are variable and to some extent unpredictable from year to year. Hence over a period of years it can be said of the hunting ranges on sea ice only that they are bounded by the extreme limits of the occurrence of these phenomena. Much of the land surface on the Arctic mainland consists of gently rolling, treeless plains, with few if any barriers or confinements to visibility or winter travel.

Thus a man hunting bears will set out in the general direction of the floe edge, or a man hunting caribou, in the general direction in which caribou are thought likely to be found. During this journey, if the weather is good, the hunter has complete visibility for miles around. He also has virtually complete freedom of movement over both land and ice in any direction. Should he see caribou or bears several miles off his path, he would naturally pursue them.

Over a period of time the hunting of these resources results in a thorough coverage of an area, even though each individual hunting tip could be conceptualized as a single line corresponding to the route followed. However as no two trips are likely to be the same, and during a few seasons hunting, a man would have made dozens if not hundreds of such journeys, the territory travelled, scanned and hence hunted over is most reasonably and accurately represented as an area on the maps.

Fishing is limited to certain lakes, river mouths, or deep wintering holes upstream. In large bodies of water fishing may occur anywhere, otherwise it occurs in specific locations which, at a map scale of 1:500,000, approach the characteristics of a point rather than an area.

The Interview

An individual interview with a hunter was generally preceded by a brief introduction to outline the objectives of the study, and to ensure an understanding that personal information to be obtained was for the stated purpose of the study. In some cases it was merely necessary to state that the visit was in connection with the Inuit Land Use and Occupancy Project, as, after some weeks of interviewing in some communities word of the project preceded the interview.

Most interviews were conducted in the respondent's own house. In some settlements, where extensive map coverage was required (as in some Keewatin communities), it was more practical to ask the respondent to come to a building in use as the project's local office.

Individuals were asked to identify land use areas, for each of the appropriate categories listed in Table 3, either directly on topographic sheets of the region (1:500,000 scale), or on a sheet of tracing paper held in place over the base map with masking tape. In many cases it was noted that individuals took great pains to locate areas with care and precision, often referring to another household member or a visitor for corroboration of the data being volunteered. This apparent uncertainty is discussed further below.

Felt-tipped pens with different coloured inks, or coloured pencils were used to distinguish between different land use categories, and numbers were added to separate activity by time period.

Generally one map sheet (or tracing paper overlay) was made for each respondent.* However, in a few cases the map biographies of two or three men were represented on a single map or sheet of tracing paper, though care was always taken to ensure that the particular data were referable to the individual whose biography was represented.

The date of the interview and the initials of the interviewer(s) were recorded, as well as the name of the respondent, on each map biography sheet.

Evaluation of Fieldwork Procedures

In this part of the report we attempt to critically evaluate the effectiveness of the approach adopted, pointing out the shortcomings of the methods used as well as offering an evaluation of the quality of information obtained.

The main problems relate to memory attrition when gathering oral history; differences in perception between native respondents and non-native interviewers; individual variations in perception; and the problems of communicating technical information between two different languages.

Memory

Informant recall is the basis of all anthropological research in the many societies around the world possessing an oral, as opposed to a written, history. Even so, anthropologists recognize "better", or more "reliable" informants among the people they interview. Some people are specialists, the recognized authority on some aspects of a group's corpus of knowledge. However, when it comes to autobiographical data, most anthropologists find that interested, sincere informants

*The only exception to this was in the case of Banks Island where previous research by Usher was readily converted to appropriate form for project purposes. However, Banks Island residents were interviewed in regard to land use on the mainland and elsewhere.

possess a very complete record of personal information often stretching back into their very earliest childhood years.

People in a non-literate culture are *trained* from childhood to remember accurately. For boys, and then, men in a hunting society, the greatest emphasis in training is placed on accurate recall of environmental information (see chapter by Arima p. 31, and by Laughlin, p. 193).

Memory attrition is inevitable in the older informants, and in many cases it was apparent that very incomplete data were being assembled on Period I land use. Much of the information obtained for this earliest period occurred in general statements, rather than specific, personal information, and resulted in large part from the need felt by informants, not only to tell the literal truth (see following), but also to be seen to have told the truth through subsequent, independent corroboration. Thus information of general knowledge was usually volunteered, and predictably more easily elicited in group, rather than in individual, interviews.

In view of the incomplete, and often minimal information obtained for Period I, very few Period I land use maps are included in Volume Three of the report, and general statements only are provided in Volume One for this early historic period.

Native Perceptions

The Inuit Land Use and Occupancy Project had two objectives which do not sit very easily together. On one hand, the information gathered must be amenable to analysis – specifically, it must be amenable to computerization and cartographic representation. On the other hand, land use and the hunting environment are recorded as Inuit hunters and trappers described them, and through these descriptions we have attempted to build up a picture of Inuit perceptions of land and their use of it. The first objective requires the use of categories with which social scientists are familiar; the second objective may well require categories that are as yet foreign to social science.

However, the two objectives are not theoretically irreconcilable; there is no reason to suppose that the categories which local people in fact employ could not be adopted as the organizing principles for the data, and thus become the basis for "scientific" formalization. In practice, however, two considerations render that reconciliation unlikely, if not impossible. First, although the project covers an extremely wide geographical and cultural range, it must still aim for some degree of procedural uniformity. It is improbable that native categories could readily be found which did not do some violence to the local perceptions of one or another region, or even, to local variations within a single region. Second, only an elaborate preliminary research project could discover all of the possible categories and permit a choice among them – and the urgency of the study has not allowed this luxury.

The differences between the study's two objectives, namely to obtain analyzable data which must be true to Inuit perceptions, created difficulties that were very often apparent. These difficulties arose in relation to all the most important animals. Consider, for example the case of seal hunting in north Baffin Island and Foxe Basin. When hunters speaking that local dialect talk about seal hunting, they distinguish basically between the kinds of seal hunting: the term for a seal lying on the ice is entirely different from that for a seal surfacing in open water, and different again from that for a seal which has not yet left its birthplace by the breathing hole. Thus, when these hunters talk about their seal hunting, they use terms to indicate what kind of hunting they are doing, and the kind of hunting varies, of course, with the time of year. It seems, therefore, probable that Inuit perception of seal hunting is based on categories which are foreign to non-Inuit. Importantly, therefore, when a hunter is asked to indicate on a map all the places he has hunted seals, the form of the question itself is likely to make it difficult for him to answer with ease and accuracy. The general question, "where have you had ringed seal hunting places?" does not conform to his own way of thinking about seal hunting, which might be, "where have you had seals-on-the-ice hunting places?" Or, "seals-at-their-breathing holes hunting places", and so on. By using southern categories we inevitably made it more difficult for a hunter to answer completely and accurately, although in some localities hunters dealt with this difficulty by breaking up the hunting range for a species into a multitude of small areas which correspond, in all probability, to more than one kind of hunting for the same animal. All the local hunting areas for each species are represented on the composite (summary) maps; thus these small areas have been combined to give the range over which a species has been hunted, without regard to the different types of hunting which would be a more accurate reflection of local perceptions in regard to the exploitation of that particular environmental resource.

Another, and perhaps more serious, methodological problem lies in the hunter's ideas of how hunting itself proceeds. As stated above, the project aims to chart hunting ranges, in both their core and peripheral areas, and indeed to include any other terrain where a hunter has tried, successfully, or not, to find game. When asked to map their hunting places for one or another species, many respondents drew remarkably small areas. However, it is evident that various hunters describe their ranges on paper in radically different ways. When asked to show caribou range, for example, some men indicated tiny locales, in some instances scarcely more than sets of dots, whereas others indicated comparatively enormous areas. On occasion, a fieldworker was discussing caribou range with a hunter whom he had accompanied on a number of hunting trips. The respondent marked his caribou hunting areas and when asked if that was all, he insisted that it was. The interviewer, however, recalled that on one occasion the

two of them had hunted caribou together in an area that was not marked. The following instructive exchange occurred:

HB: "But what about here, by the lake. You have not marked that. I remember we hunted caribou there."
A: "Yes, we hunted there, but you know that we did not do very well there. That place has never been much good in the winter."
HB: "But if you have used it as a hunting place at all you should mark it."
A: "I do not want to tell any lies. There are very few caribou there. It is not a really good hunting place for caribou."

That tendency to mark only the probably successful locations was in some cases extreme, and maps tended to be composed of sites where kills had been made, or where the respondent judged the very core of the caribou herds to be located.

Individual Variations Between Species

It is important to note that the hunting range of some species caused far greater difficulty in mapping than did others. The difficulty turns on the comparative ubiquity of a species, and the measure in which it does or does not have very definite locations, as well as its associated cultural value.

One middle-aged man refused to enter ptarmigans, Canada geese, or wolves, saying that such creatures are not hunted in any particular place, but rather are hunted at all times. Much the same difficulty arose with seals in general (though not with seals when discussed according to technique used and time of year). When that man was asked to mark all the places he had hunted seals, he would not enter the routes between Pond Inlet and the Arctic Bay region, saying of those routes: "I am not hunting for seals; I'm merely travelling by dog-team and killing seals." In the same spirit, he noted that he was not going to mark those places where he "merely killed caribou", but only those areas into which he regularly went precisely because he expected to find caribou there – those are the real hunting places. In trying to communicate what he meant by the distinction he persistently made during the interview, he said of his pursuit of the Arctic char: "I have fished everywhere; but I have not really fished (sought after fish) at all." That somewhat enigmatic statement perhaps indicates the radical difference between Igloolingmiut perceptions of hunting and those which are inevitably built into the methods this study has adopted.

Differential Importance of Land Use Categories

Some men were much more ready than others to locate their Arctic hare and ptarmigan hunting areas; a small number of respondents were unable or unwilling to do much more than indicate a very small number of locations; others seemed to delight in marking a multitude of sites for even the "least significant" species. Apart from the considerations mentioned earlier which might contribute to that variation, there are other factors at work here which have some importance. All animals which are hunted do not have the same importance. Successful hunters of bears, narwhals, and walruses tend to be accorded high status, and there can accordingly be a certain pride which comes from insisting that lesser species have not really been bothered with. Among the "lesser" species are Arctic hares, ptarmigan, ducks and loons. This does not mean that they are not favoured foods. Similarly, in a few locations hunters take a great delight in eating fulmars, but certainly do not make much of having hunted them. Fulmar hunting ranges on maps thus appear in the form of tiny areas — which in fact are the nesting cliffs — despite the fact that during the summer in those regions, fulmars can be, and have been, hunted in virtually any place where seals are hunted. Arctic hare and ptarmigan ranges are enlarged in some instances simply because men often hunt for them as they work their trap lines, and therefore have marked on their individual maps areas which correspond to trap lines. It follows from these considerations that a species which has low status and wide geographical range — i.e. does not have year-after-year locales — will tend to be minimized by hunters as they draw up their maps.
Examples of such species include: ptarmigans, berries and black guillemots. The most extreme case is the sculpin. When asked to mark sculpin fishing areas many respondents declined, or with an amused disdain marked only a few places, despite the fact that very many of the men have eaten and enjoyed this abundant marine fish.

Communicating Technical Data Across Cultural Boundaries

The above-mentioned difficulties were further aggravated by another which also demonstrates the tensions between the wish to record local perceptions and the need to standardize for recording purposes. The convention chosen for purpose of subsequent data storage, retrieval and analysis, required that all land use categories but campsites and trap lines be recorded on map biographies as fully enclosed circles (circumscribing areas of land use). Many hunters, however, simply did not perceive their hunting in terms of areas which could be so represented. There is no clear edge to where hunters look for caribou on the tundra — one year they go farther than other years. They do not think of the farthest they have been in each direction as the effective perimeters of a hunting range. Rather, these hunters tend to think of travel lines, routes across the land, around which, or alongside which, or at the end of which, they expect to find the game which they are consciously pursuing. Looking at a map a man can point to the routes — especially in difficult travelling country where much the same passes, valleys, and fiords would always be used — and indicate where along those routes he most often

found a particular species. When asked to indicate a hunting range, then, many hunters liked to put in lines and loops, not circles. Since the finished maps had to be composed of circles, the hunters were urged to use circles. As a result they tended to mark inner hunting areas — the favourite spots, where kills had been made, the core areas — rather than outer perimeters. Thus the methods the study adopted tended to generate understatement of land use.

The tendency to draw in lines and loops, indicative as it is of the high degree of mobility which almost all Arctic hunting involves, also corresponds to another general problem: there is no time when hunters are travelling and not on the general look-out for an animal, for tracks, or for any signs of game. If a man is pursuing caribou on the land during summer he is also on the look-out for berries, ptarmigan, eggs of larger waterfowl, etc. In that sense the entire summer walking range could be regarded as the range for all the *possible* finds. Hunters do not, however, mark their ranges in that way.

Travel routes often pass through, or close to, adequate hunting territory; dog-teams must be fed, and all journeys require some hunting. But hunters distinguish between travelling and hunting, even though they hunt when they travel. When the interviewer asks for a hunting place, therefore, the respondent is anxious to locate a *place*. He is also concerned with truth, and some men remarked that they felt it would be less than honest to mark as a hunting place the vast areas over which they had travelled with an eye open for game. The smallness of circles which hunters often drew both reflects the vast distances over which they in fact hunted and their concern with highly relevant distinctions. The individual maps often had such concentrations of small circles in one area that they in effect amounted to a complete coverage of a large continuous area, and in those cases, the fieldworkers marked in the area accordingly. Other maps, however, have an abundance of small regions which are, in effect, core areas rather than full ranges. For that reason the strong and general tendency is towards understatement of hunting range.

The Language Problem

There are numerous ways of asking where a hunter has hunted.* The way that is chosen will significantly effect the type of answer given. In the case of Arctic hare, for example, the possibilities are as follows:
(a) nani ukalimik pinasualaursimaviit?
(b) nani ukalirasuqattarpiit?
(c) nani ukalisiurpiit?
(d) nani ukalisiurviqarpiit?

*In the western Arctic region much of the interviewing was carried out in English, though fieldworkers had the facility to use the local language if the respondent required it. Appendix II is the sample instruction sheet for interviewers working in Aklavik.

The English meanings of the four possibilities can be characterized as:
(a) where have you been working at (i.e. killing) hare?
(b) trying for (i.e. hunting);
(c) seeking for;
(d) having a place for finding.

Respondents might therefore be asked to encircle any of the four things, all of which are different.

a. in fact produces only locations where a hunter actually engaged with animals, and tends to yield maps of kills. In the case of bear hunting that would be an extremely serious error, since large areas are hunted over but only small numbers of bears are actually "killed".

b. is also beset with much the same problem, tending to confine a hunter's answer to limited places.

c. gives the widest possible interpretation, but tends to fall into two opposite difficulties because of its vagueness. On one hand, if the interviewer encourages the respondent to interpret the question at its widest, the answer is reluctant, for it seems to him to be dishonest; on the other hand, if the interviewer encourages the specificity which is closer to the hunter's own perceptions — and therefore closer to the kind of meaning which he is probably inclined to give to the c. formulation — then once again the result is core areas.

It seems formulation d. is the correct way to ask about hunting, and gives maps of favoured hunting grounds. In practice, therefore, it tends to result in descriptions of core areas, and again, an understatement of the actual hunting range.

The Concern for Accuracy

It can be seen from the preceding discussion that most maps are likely to be in some measure understatements of range. It remains to be asked whether we can assume that simple error — either in the form of inaccuracy, poor recall, or misrepresentation — is likely to have affected the results.

Earlier in this paper we have mentioned the Inuit concern with literal truth. That concern can hardly be overstated. In the Igloolingmiut dialect that concern is evidenced most strikingly by the use of the word *sadlujuq*, which is the closest equivalent to the English word "lie". In fact, *sadlujuq* is used to characterize both the deliberate and inadvertent lie. When hunters were filling in maps they often noticed that they had slightly mislocated a site, or had neglected to include a part of their land use. As they noticed any such error they would exclaim: *sadlujutit*. The force and stigma attached to that term is much the same as the English "you liar", but the application of the term does not require that the "lie" be deliberate. A man is strongly criticized for making a mistake, for misremembering, as if he really were — in the English sense of the term — a liar. It is not surprising, therefore, that

respondents took enormous pains to be accurate. Nor would it be surprising, in a society that has depended so acutely on detailed knowledge of the land and highly accurate recall, to find that details of land use seemed to be remembered faithfully over many years. If cross-checking and overall consistency are tests of truth, then it can safely be said that accuracy and honesty were in virtually every case beyond doubt. When a hunter was unsure he often checked with someone who might be more sure. Where he remained unsure he was inclined to leave it out.

That does not mean, of course, that there are no inaccuracies. In some cases it was evident that the map was being misread and, for example, a location being situated on the wrong point. On individual land use maps there are bound to be some mistakes. But the majority of those mistakes are either matters of tiny imprecisions or are omissions. Though maps were refined through the verification procedures (see following), or by being available for inspection during fieldwork, they can doubtless be further improved. There were sometimes disagreements between hunters about where a particular floe edge or place name should be precisely sited, but these again were matters of minute detail, and we are confident that the data as finally represented on composite maps in Volume Three are vulnerable only to the charge of being over-cautious statements of historical fact.

It should finally be noted that only in certain locations were respondents conscious of the fact that these maps might at some stage be related to land claims and the negotiations which those claims might entail. People did remark that Whites who come north tend to make a multitude of mistakes when it came to talking about the land, and many were critical of wildlife legislation and enforcement procedures. However, such concerns lent to the general determination to give precise data on every aspect of land use and occupancy. At no point did any of the fieldworkers report awareness of bias which might lead respondents into expanding their hunting range. On the contrary, in many instances margins, or certain types of land use activity were excluded. In conclusion we can state unequivocally that a concern with honesty and accuracy entirely outweighed even the possibility of politically motivated overstatement.

The Verification Process

Rationale

Maps for each community and each time period were produced by aggregating the individual map biographies obtained in each community. Insofar as the number of hunters interviewed was, in all communities, less than the total number of hunters potentially present, and aware that underestimates of hunting range were likely given in many cases (see above), the composite maps required examination and possible change before they could be said to accurately represent the historic land use of the living members of that community.

The same possibility of an incomplete or otherwise inaccurate land use report also required local inspection and feedback before the study could assume to have discharged its responsibility with the greatest possible attention to accuracy and completeness.

Procedure

The general procedure followed was to arrange, through the community council or some other appropriate local group, to hold a meeting to discuss the interim Land Use Report, and composite land use maps pertaining to that community and neighbouring communities in some instances. Such arrangements were made by letter or telephone and telex up to a month prior to the date of the meeting, but sometimes at shorter notice.

In some cases (e.g. in the western Arctic and Keewatin communities), summary reports were prepared and sent into the communities some time before the meetings. In most cases, however, the report and/or maps were examined at the time of the meetings.

Some variation occurred in the type of meeting deemed appropriate by councils charged with the responsibility of making local arrangements. Thus in several communities (e.g. Coppermine, Paulatuk, Whale Cove), open public meetings were held; elsewhere meetings were restricted to members of the Hunters and Trappers Association (virtually all adult males) and members of council (e.g. Baker Lake, Tuktoyaktuk). In a minority of cases only members of council (e.g. Pangnirtung, Holman Island, Southampton Island), or locally constituted "verification committees" (e.g. Eskimo Point, Igloolik) attended such meetings. However, in all cases, the time immediately preceeding and following such meetings was taken up with informal visits to knowledgeable local residents, so that, as far as time allowed, maps were well inspected in the communities. Some councils made very careful arrangements to ensure that approval of the maps and reports was well considered. The case of Pangnirtung will serve as an example.

On our arrival at Pangnirtung, the Chairman of the local Hamlet Council was contacted and the purpose of the visit was outlined. He arranged for an evening public meeting in the school to display the maps. About 30 adults, mainly hunters, attended, and a good deal of informal discussion took place concerning the maps on display. As a result a number of individuals were identified who had particular information concerning amendments to the maps. During the next three days these several hunters were visited in their own homes and additional information was obtained, and added directly to

the maps. Following this series of meetings the maps were displayed during a council meeting (in council office) to which two especially knowledgeable local hunters had been invited to attend by the Chairman. A full discussion of the maps ensued, and then council moved and adopted a resolution approving of the maps as an accurate representation of the community land use. The following day a written communication, signed by the Chairman of the Hamlet Council, was received.

Not in every case were arrangements so fully structured. However, informal contacts with knowledgeable local people outside of public meetings remained the best way to obtain critical comment on the maps, and this avenue for obtaining feedback was as fully exploited as time allowed in each case.

In some communities it was not possible to hold public meetings at the time of our visits (e.g. Rankin Inlet, Frobisher Bay). In such communities informal meetings with those individuals knowledgeable about local land use was all that could be achieved, and for several reasons it has not always been possible to obtain written confirmation of verification in these instances as no group was constituted or felt authorized to speak for the community.

Out of 33 Inuit communities in the north, formal verification procedures were followed in 24 cases. As a general rule, a few days to one week was spent in each community. Directors of research, who compiled the maps and local reports, attended all meetings, and the project director was present at meetings held in 13 of these communities.

It proved impossible, for logistic and time reasons, to visit every community. In some cases (e.g. Port Burwell, Sanikiluaq, Grise Fiord) no verification by local people has been attempted. In some other cases (e.g. Bathurst Inlet, Broughton Island, Lake Harbour), though visits were not made to the communities to obtain feedback, a sufficient number of former residents of those communities now reside in other locations (e.g. Cambridge Bay, Frobisher Bay) to allow feedback on the maps and some idea of where change was required. Thus this group of maps, though not formally endorsed by the representative authorities in the community, nevertheless has been subjected to expert scrutiny and amendment. Table 5 summarizes the results of the verification procedures in each case.

Table 5
Schedule and record of verification meetings

Community	Time of meeting(s)	Statement on file re. meeting	Written verification received
Aklavik	July 1974	Yes	No
Arctic Bay	Feb. 1975	Yes	Yes
Baker Lake	Oct. 1974	Yes	No
Bathurst Inlet	Sept. 1974**	No	No
Broughton Island	Jan. 1975*	Yes	No
Cambridge Bay	Sept. 1974	Yes	No
Cape Dorset	Jan. 1974*	Yes	No
Chesterfield	Dec. 1974	Yes	No
Clyde River	Jan. 1975*	Yes	No
Coppermine	Sept. 1974	Yes	No
Eskimo Point	Nov. 1974	Yes	No
Frobisher Bay	Jan. 1975	Yes	No
Gjoa Haven	Oct. 1974	Yes	No
Grise Fiord	—	No	No
Hall Beach	Jan. 1975	Yes	No
Holman Island	Sept. 1974	Yes	No
Igloolik	Jan. 1974	Yes	Yes
Inuvik	May 1974	Yes	Yes
Lake Harbour	Jan. 1975*	Yes	No
Pangnirtung	Jan. 1975	Yes	Yes
Paulatuk	May 1974	Yes	No
Pelly Bay	Oct. 1974	Yes	Yes
Pond Inlet	Feb. 1974	Yes	Yes
Port Burwell	—	No	No
Rankin Inlet	Oct. 1974	No	Yes
Repulse Bay	Jan. 1974	No	Yes
Resolute Bay	—	No	No
Sachs Harbour	Jan. 1974	Yes	No
Sanikiluaq	—	No	No
Southampton Island	Oct. 1974	Yes	Yes
Spence Bay	Sept. 1974	Yes	No
Tuktoyaktuk	July 1974	Yes	No
Whale Cove	Oct. 1974	Yes	Yes

*Meeting held in Frobisher Bay.
**Meeting held in Cambridge Bay.

Appendix I: Sample Information Sheet Distributed in the English and Inuit Languages

The Inuit Land Use and Occupancy Project is a study which is being made for Inuit Tapirisat of Canada. We will be making maps that will show where people have lived, hunted and fished in their lifetime. We will be asking questions to every hunter in the village. We will ask people where they were born and where they hunted and fished when they lived on the land and when they came to live in Gjoa Haven. These maps will show how things have changed and will make a history of how land has been used by the Inuit who are now living in Gjoa Haven. People will be able to look at these maps and show their children where people used to live and hunt long ago as well, where animals are found now and where people go to hunt them.

We will also be asking people what feelings they have about the land, what is the importance of land to them and what are their thoughts about the land when they travel and hunt.

In addition to the first kind of maps, where we will ask every hunter where he has lived and hunted, we will be making two other maps. One will show all the places where animals are usually found. The places where animals (like caribou, polar bears, geese) feed, breed, migrate and make their dens will be shown. The other map will show what names people have given to places and where *Inuksuit,* old houses, stone fox and caribou traps, and weirs are. Places where people went to gather such things as driftwood, willow, soapstone or peat will also be marked.

When all these maps are finished, they will be sent to Hamilton, Ontario, where there are people who will put these maps together. These people have been hired by Inuit Tapirisat to do the work for them. Maps, like the ones that are being made here in Gjoa Haven, are being made in all places where there are Inuit. When maps for Gjoa Haven are finished, we will bring them back to show people what they look like so that if there are any mistakes the maps can be changed before they are put into a book. When the book is ready, it will be given to Inuit Tapirisat.

Inuit Tapirisat wanted these maps made because they wanted all the places where Inuit have lived, hunted and fished to be recorded. Inuit will be able to look at these maps and learn about how life was before people moved to the settlements and where they live and hunt now. It is important that these things are written for all Inuit in Canada before they are forgotten.

People in the south and in the government are interested to learn how the Inuit use the land and why it is important to them. The maps that we are making will help people to understand the Inuit way of life. The land is important to Inuit people but sometimes the people in the south do not understand why this is so. Inuit Tapirisat has another project, the Land Claims study, where people have been hired to study the law and show that because Inuit have always lived and hunted on the land, it should be kept for them to be used in this way. The maps that we are making will show the places that have been used and that are important to Inuit.

We will be asking many questions to make these maps and they are important for all the reasons that were mentioned. We will need people who are interested in making these maps, and for this they will be paid. If you are interested in helping or if you have any questions to ask about the maps, you can ask Carol Brice-Bennett or Rachel Qitsualik about them.

Appendix II: Sample Instruction Sheet for Fieldworkers

The following information should be asked first and written down in a note book.

Where born. What year.
Where raised.
Where started hunting and trapping, what year.
Location of each winter camp after that, and what years or how long they were there.
What year moved from Delta into Aklavik.
Note years in Inuvik or working on DEW-line.

Important: mark name and date of each individual on top of page in notebook.

The following information should be asked next, and recorded on the maps.

Trap lines: Only trap lines should be marked on as a line. No other type of line should appear on the map. This will be mainly for long trap lines, especially those going out of the Delta, to say, Shingle Pt. or Kendall Island, or for those who trapped around Herschel Island. Otherwise, for trapping in the Delta, if the person cannot put on an exact line, just mark the area by writing TRAPPING or RATS over the general area that he shows you.
Find out all ratting areas and write RATS over each area.
Note the registered trapping area and write RTA over each area.
Find out all whaling areas and write WHALES over each area.
Find out all goose hunting areas and write GEESE over each area.
Find out all moose hunting areas and write MOOSE over each area.
Find out all fishing areas and write FISH over each area.
Find out caribou hunting area, write CARIBOU over each part. Especially for caribou, you will have to ask how far they have been south (for example, Sheep Creek), how far west (for example, Fish Hole, Blow River). You will have to write caribou more than once, make sure you cover each area so I will know the whole range.
For those who trapped the Yukon coast, make sure you find out how far up the Firth River or into the mountains they went hunting. Also note sheep hunting areas.

Important: mark names and date of each individual on each map that you use for him. Use three colours on each map (red, black, blue).

Good luck.

Rationale for a Comprehensive Land Use Data-Base

by Allen K. Philbrick*

Introduction

A map of the Northwest Territories shows 33 Inuit-occupied communities which, with the single exception of the Belcher Island community in southern Hudson Bay, define a diamond-shaped region that is the ecumene or "life-space" of the Inuit population occupying that part of northern Canada. This ecumene extends, from the western point of the diamond, at the Alaskan border, almost 2,000 miles to Port Burwell at the southeastern extreme of Hudson Strait, and from southern Ellesmere Island at the northern extreme more than 1,000 miles south to the Manitoba border on the western shore of Hudson Bay. Three of the four sides of the region are bounded by water: the Beaufort Sea on the northwest, Baffin Bay and Davis Strait on the northeast, and Hudson Strait and Hudson Bay on the southeast. The fourth side traverses the mainland, the southern treeline margin of the tundra.

The contiguity of Inuit occupancy of the whole region is demonstrated by the fact that a circuit of 125 miles radius around each point connects all but one of them as by one contour. Only the Belcher Island community is more than 250 miles from any one of the other communities within the Northwest Territories. However, even in the Belcher Island case, this degree of contiguity among all communities comprising the Canadian Inuit population is maintained, for the apparent interruption merely results from alien political boundaries drawn between the Northwest Territories and Quebec.

While by southern Canadian standards, the population and the overall size of the region is immense, nevertheless the degree of contact maintained between neighbouring communities through wide-ranging land use practice provides a spatial continuity among the regional population and, furthermore, suggests that a population separate and distinct from the areas to the south occupies that region of Canada. Whereas to the Canadian inhabitant to the south this northern region seems virtually empty and unused, to the Inuit it is a homeland. Indeed, in a historic sense the Inuit are the only true occupants of this region insofar as they developed the capability to live directly from the resources of the environment which they alone originally inhabited.

Approximately 1600 interviews were conducted among adult hunters and trappers, distributed throughout and encompassing virtually every part of the region. The information these interviews provided comprise the substance of a comprehensive data-base and represent a truly composite time — space biography of the contemporary Inuit population of the Canadian Northwest Territories.

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Rationale

The purpose of this report is to state the rationale for creating a comprehensive systematic basis for the permanent record of the land use information derived from such a large number of interviews over so large a section of Canada's national territory. The Inuit Land Use and Occupancy Project has provided a unique opportunity for both the Inuit and others to have, for the first time, a comprehensive portrayal of the land use and occupancy of this great region by its living indigenous population throughout the many years of their collective life times. Among the first considerations given to the processing of data derived from the initial field interviews was an answer to the important question: "What is the justification for developing a permanent comprehensive record of the land use data derived from the project?" The answer to this question depends on one's assumptions with respect to the importance of the data and the range of potential uses to which one might responsibly expect the data to be put.

Assumptions

It was apparent early on that the data from the expected number of interviews represented a very valuable source of information of immediate and long range significance for administrative, political, legal and local historical purposes, as well as having significance for scholarly research which might or might not relate to the more practical considerations. Therefore the time, effort, and funds to be expended for creation of a comprehensive geo-coded computer-access data-base to facilitate storage and retrieval of the project information would be of great merit.

The nature of the data requires location in order for its significance to be appreciated. The interviews with hunters and trappers in the communities produced map overlays on which a wide variety of land use activities are recorded as points, lines and areas through several successive blocks of time. Each trap line, each remembered area of hunting of each species of game, each campsite becomes part of the visual record of a man's life over the territory and activity-span of that individual. How can such a diverse set of records be combined, community-region by community-region, with systematic accuracy so that it can be examined flexibly and separately item by item, and in any kind of combination? Geographical coding, by small unit areas of fixed location, offers this kind of flexibility for each variable (Tomlinson 1972).

The nature and range of the questions which could potentially be asked of the data-base requires maximum flexibility in combining and separating the available information. Yet the territory that the Inuit used for hunting and trapping is not divided into convenient parcels of readily identifiable and

localized dimensions, such as the infrastructure and relatively stable uses of land afford southern Canadians in the settled and built-up portions of the country. Consequently, arbitrary unit areas, such as, the Universal Military Grid systems are a convenient means of accurately fixing the locations of campsites (as *points*), trapping *lines* and *areas* of hunting, place by place, hunter by hunter, species by species, community by community, time period by time period. Too fine a mesh of unit areas would vastly increase the number of territorial bits per settlement and render data processing unmanageable and unreasonably costly. Too coarse a mesh would result in excessive generalization and loss of meaningful accuracy. A suitable scale, representing the smallest feasible unit area was assumed to be a grid square with five kilometer sides, that is, 25 square kilometers, or approximately 10 square miles (9.6). If one uses the more familiar "mile" measure, each unit area (grid square) is approximately 3.1 miles along each side.

A point on the map representing a settlement site, for example, will be located within an accuracy of at least 2.2 miles of its true location. Any aggregation of two or more kinds of activity or the same variable recorded as the activity of two or more individuals will be sorted locationally into gridded spaces 3.1 miles (5km.) square. The inability to locate any closer than a limit of 2.2 miles is balanced by the overall consistency of enumerating and identifying any combination of activities occurring within the total territorial extent of the project (covering about 1.4 million square miles) into identically-sized unit areas precisely and uniquely identifiable and locatable, provided by subdivision of the 1,000-meter Universal Transverse Mercator Grid. With respect to the merits of this particular grid system, the federal Department of Energy, Mines and Resources states: "The beauty of the UTM rectangular grid is that by using a brief code consisting of zone and grid-line numbers it is possible to identify any point in Canada, even if that point is not otherwise marked or identified on any map." (Canada 1969)

Integrity of the Data

One of the key requirements of scholarship is maintaining the integrity of original data. Perhaps no one is more conscious of the inherent sources of error in data created through personal interview than those conducting the interviews. The comprehensive system for translating the approximations of truth (resulting from map-interviews with Inuit hunters and trappers), must maintain the capacity to return every data item for every person interviewed to the original disaggregated state in which it was first coded. With the original integrity of the data assured, the steps through which data were processed from start to finish can be rechecked any time against any possible error or misrepresentation. This capacity affords protection against data misuse which many people instinctively feel is threatened by "burying" information in a data bank. In this sense integrity of the data means the capacity to return to the smallest unit area and to the smallest information "bit" variable by variable, person by person interviewed, by time period, by named locality, for any grid position, or combination of grid positions. Whatever minimum degree of specificity was originally built into the design of the geo-coded data bank is retrievable.

On the other hand, it would be presumptuous to aim for any greater alleged precision than a mile or two either side of a line drawn on a topographic map at 1:500,000 scale (eight miles per inch). Also, when it is borne in mind that encircled "areas" where species hunted are remembered images of areas covering many hundreds or even thousands of square miles, and that perceived routes of past trapping must be the effective catchment zone for a baited trap line, such recordings are at best good approximations. In such a range of contexts, it is altogether reasonable to treat all those lines as bands or zones, extending one to two miles either side of the "actual" line on the map.

Audiences to Which the Project Addresses Itself

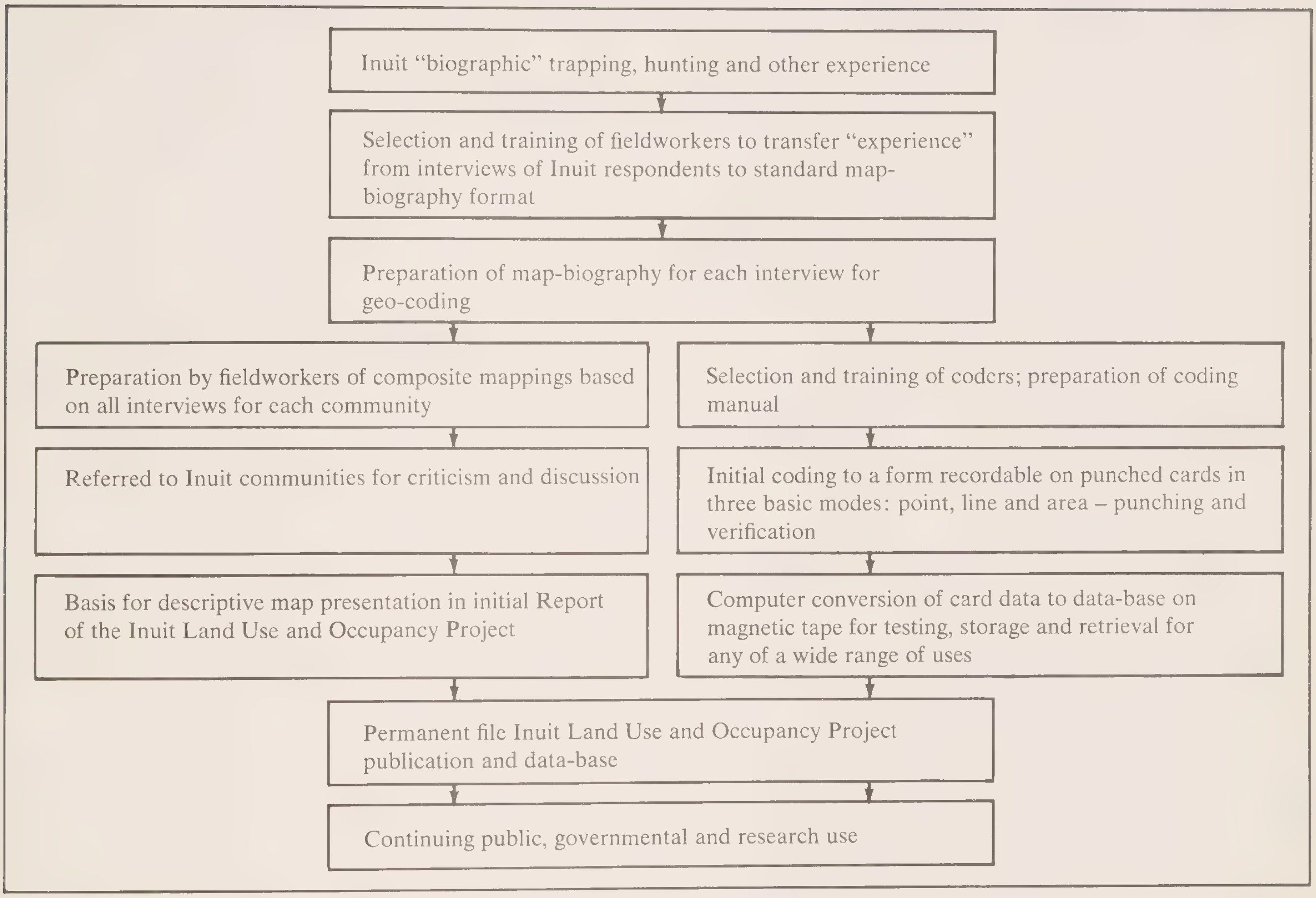
There are basically three different audiences to which the results of the research are directed, and the data-base serves all three. The foremost audience is the Inuit population whose purposes are being served primarily by the Inuit Land Use and Occupancy Project. Secondary is the larger public interest of all Canadians whose interests in discussions over future land use policy and practice in the Arctic are represented by the government of Canada. The third audience is the community of scholarship which will come to see in the data-base so created an archival resource for continuing research activity involving the land, wildlife and peoples of the Canadian Arctic. Such technical and scientific expertise, in turn, will be addressing the first two audiences in the future.

It was with responsibilities to all three groups of users in mind, in both the short and the long run, that the developmental stages of the computerized data-base took place during the period, October through December 1973.

Stages and Procedures to Produce a Permanent Record of the Project

It is inevitable, when considerations of a permanent record enter into the planning of research, that there is an impact upon all the stages of the activity from data collection, recording and processing, to final storage and retrieval for future

Figure 1
Flow chart: Progressive stages in data handling



use. It became clear that the interview stage of data collection had to be shielded from the complexities of data-coding. The heart of the data collection was the personal relationship of the fieldworkers conducting the interviews with the Inuit respondents. These workers used 1:500,000 scale topographic sheets for the field collection of the patterns of biological activity from interviews of Inuit hunters and trappers. A synopsis of fieldwork requirements was issued to fieldworkers, most of whom were fully briefed concerning standardized procedures to be followed (see Fieldwork Methodology chapter, p. 47).

The fieldworkers then faced the task of compiling a tracing overlay for each interview for geo-coding, separately, by colour, or other notation, the data obtained in each interview into significant time periods. Two to four time periods (usually three) were recognized, not by particular dates but rather by identifiable changes in the life-styles of the communities in which the interviews were conducted. Thus the most recent time period enbraces the years during which most of the population has settled into living in modern administrative-educational centres in the north; preceding that are the several decades of the fur trade years, and earlier still is the time preceding the local establishment of fur trade posts in the respondent's territory.

The flow chart (Figure 1) illustrates the relationships which were required to be maintained throughout the stages of the project, if all of its purposes were to be successful, and its longer range of permanency of recording were also to be attained. In recognition of the fact that the general public and technical experts differ in their need for, and interest in, levels of detail and analysis, two broad streams of data processing were maintained. One culminates in the initial publication of the results of the investigation, namely the Inuit Land Use and Occupancy Report, and may be termed *descriptively informative.* The other stream is oriented toward facilitating answering questions and solving problems arising from the

unfolding inter-relationship of the Inuit with the rest of Canada. The latter, focused in the data-base of the project, may be termed *analytically informative*.

The training of coders and the solution of the problem of coding the individual overlays in a form suitable for key punching was accomplished by McMaster University Academic Systems and Programming Department (Masterson 1974). The programming for the creation of the data-base on magnetic tape from the punched cards was also accomplished by the same department (Bhargava 1975).

Types of Potential Output from the Data-Base

While the potentialities are virtually unlimited, it will be useful to draw attention to certain types of output for which such a data-base is ideally suited. They arrange themselves into three primary classes: aggregations, combinations, and ratios.

From the coded data-base it is an easy computer operation to count the number of times any given variable occurs in each grid square. Thus if there are 20 hunters and trappers active over the time period of the last 10 years, to find out how many of them have hunted or trapped in each of the grid squares which extend in all directions from the community would be tedious and time-consuming if one had to plot the data by hand from the original map biographies each time some particular answer were required. On the other hand, if one wished to compare the extent of, or alternatively the frequency of, such use of the land for each of the whole range of species for each community, the task of counting each item would be very quickly and accurately accomplished by computer from the data-base.

A particular measurement of great importance to the Inuit is the extent of the territory used by hunters and trappers in the pursuit of their activities. The analysis of the data-base provides totals and makes possible comparison among hunters and among communities of the true extent of territory actually used in the conduct of specific activities such as trapping, hunting caribou, polar bears, or ringed seals, over each time period. These measurements provide factual evidence of Inuit use and occupancy of the land.

A second type of output from the data-base involves combinations. Suppose there are three species of particular importance in the hunting activities of a community. A portrayal of the combined territorial extent of hunting involving these species and a fourth category, trapping, is desired. A further requirement, however, is to maintain for each grid square the identities of the species or the trapping activity which occurred in each unit area. By programming the computer appropriately, this can be achieved without difficulty.

A third type of output from the data-base involves ratios. The placing of quantities in proportion to one another is the basis of all quantitative analysis. The information derivable from the data-base for each community, for example, can be arrayed in tabular form after being subjected to standard ratio generating steps such as the calculation of the mean, standard deviation, and the range. Table 6 shows these ratios for Period III (1960–1974) land use by the 26 respondents living in Resolute Bay. Table 7 shows the extent to which these same respondents participated (or reported their participation) in each land use activity. Consider the information which can be read from these tables.

Table 7 indicates that more than half the 26 hunters were involved in fishing, trapping and hunting the following game: bearded seals, caribou, ducks, ptarmigan, ringed seals, walruses, white whales. Every hunter in the community had fished and hunted caribou and ringed seals. If we wish more information on any of these activities, let us say caribou hunting, Table 6 can be consulted.

From Table 6 it appears that the average caribou hunting territory is about 1,500 square miles (actually 1,491 square miles), with each of the 26 Resolute hunters using territories ranging in size between 200 square miles and about 4,400 square miles (4,386 square miles). Because the range in size is large (see range and standard deviation figures in Table 6), it is useful to examine the array of individual territories in order to further evaluate the significance of the average value already obtained. The array is shown in Table 8. Ten of the 26 hunters (38 percent) used less than 1,000 square miles, whereas seven (27 percent) used more than 2,000 square miles for caribou hunting.

In the case of the Resolute Bay figures the average (1,491) is close to the median value (1,173) so that it is reasonable to conclude that about as many hunters use more than the average area (say 1,200 square miles) as use less than it.

In some communities, or in the case of some land use activities, the array may appear skewed, as in Table 9. In this case it will appear, on inspection, that more than half the hunters interviewed have used more (or less) than the average-sized land use area for that particular activity. In such a situation the median, rather than the average, figure would be a better measure of equal distribution of hunters on both sides of a given area. Thus from Table 9 we can say that as many hunters use more than 240 square miles (the median figure) as use less than 240 square miles.

These kinds of elementary analysis generate a degree of awareness of the spatial context of Inuit land use. Comparisons, species by species, community by community, time period by time period can provide a profound understanding of the nature of human activity over the past half-century of intense Inuit land use in the tundra regions of the Canadian mainland and Arctic archipelago.

Table 6
Summary of Period III land use activity recorded by
26 Resolute Bay hunters

Land use type	Active participants	Extent of land use (square miles)				
		Total	Average	Standard deviation	Minimum	Maximum
Marine fish	1	9	9.0	0.00	9	9
Wolf	3	36	12.0	5.20	9	18
Arctic hare	9	144	16.0	11.72	9	45
Ptarmigan	21	1,094	52.1	58.69	9	209
White whale	1	63	63.0	0.00	63	63
Other birds/eggs	15	1,057	70.5	43.57	18	154
Goose	11	779	70.8	49.72	9	182
Duck	21	2,192	104.4	92.31	18	436
Freshwater fish	26	2,809	108.0	70.16	18	254
Walrus	20	3,093	154.7	232.95	9	1,082
Narwhal	3	581	193.7	19.30	172	209
White whale	23	4,612	200.5	225.21	9	837
Trapping	22	4,806	218.5	153.52	9	618
Harp seal	5	1,182	236.4	258.13	9	673
Caribou	26	38,772	1,491.2	1,042.33	200	4,386
Bearded seal	24	37,919	1,580.0	1,987.60	45	8,481
Ringed seal	26	54,053	2,079.0	3,215.18	182	14,769
Polar bear	24	154,419	6,434.1	3,778.73	373	15,060

Table 7
Reported participation in different categories of land use by 26 Resolute Bay hunters

Land use category	Participation	
	Number	Percentage
Marine fish	1	3.8%
Wolf	3	11.5
Narwhal	3	11.5
Harp seal	5	19.2
Arctic hare	9	34.6
Goose	11	42.3
Other birds/eggs	15	57.7
Walrus	20	76.9
Ptarmigan	21	80.8
Duck	21	80.8
Trapping	22	84.6
White whale	23	88.5
Polar bear	24	92.3
Bearded seal	24	92.3
Ringed seal	26	100.0
Freshwater fish	26	100.0
Caribou	26	100.0

Table 8
Array of 26 caribou hunting territories: Resolute Bay

Individual number	Land use in square miles
1375	200
1374	309
1373	345
1370	491
1372	518
1380	527
1377	618
1379	837
1367	910
1371	937
1376	1,019
1382	1,046
1361	1,146 – median 1,173
1378	1,201
1365	1,437 – average 1,491
1381	1,583
1368	1,810
1362	1,874
1359	1,883
1366	2,156
1364	2,302
1358	2,429
1363	2,639
1369	2,711
1357	3,458
1360	4,386

Table 9
Array of 36 caribou hunting territories: Pangnirtung, Period III

Individual number	Land use in square miles
1424	9
1404	9
1420	27
1402	27
1417	36
1398	36
1400	54
1407	63
1415	72
1421	81
1413	109
1419	118
1410	118
1403	127
1388	136
1395	191
1406	209
1385	227 – median 240
1414	254
1409	263
1396	291
1389	382
1412	391
1390	400 – mean 452
1394	482
1393	491
1418	500
1423	618
1384	691
1401	709
1425	737
1355	837
1392	1,164
1387	1,456
1386	1,856
1383	2,748

References

Bhargava, Anami
1975 *Inuit Land Use and Occupancy Project Data-Base.* McMaster University, Hamilton (mimeograph).

Canada
1969 *The Universal Transverse Mercator Grid.* Department of Energy, Mines and Resources, Surveys and Mapping Branch, Ottawa.

Masterson, J. S.
1974 *The Inuit Project: Coding of Data for the Land Use Data-Base.* McMaster University, Hamilton (mimeograph).

Tomlinson, R. F.
1972 *Geographic Data Handling.* 2 volumes. Commission on Geographical Data Sensing and Processing, International Geographical Union, Ottawa.

Inuit Land Use on the Barren Grounds: Supplementary Notes and Analysis

by David Hoffman*

Introduction

This report will deal with the land use patterns and subsistence methods of the Inuit people known as the "Caribou Eskimos" who lived in the Barren Lands to the west of Hudson Bay. These people did not normally have year-round or easy access to the sea mammals that were the major food source of the coastal Inuit. As a result, the inland way of life was unique. Kaj Birket-Smith, whose writings provide the definite monograph of the Caribou Eskimo, states in regard to this inland group of people, "it possesses a culture that is essentially different to all other forms of culture among the otherwise homogenous Eskimo stock" (1929: 9).

These inland people can be divided into six sub-groups according to geography and dialect. The Ahiamiut lived in the south near the treeline and traded at Ennadai Lake. The Padlirmiut lived further north and traded at the Padlei post on the upper Maguse River. The Harvaqtormiut lived along the Kazan River south of Baker Lake and the Qaernermiut lived in the Baker Lake area. These four groups were the people originally defined as "Caribou Eskimo" by Birket-Smith. However, two other sub-groups further north should also be included: the Utkusiksalingmiut of the Garry Lake area and the Illuilermiut who lived along the Keewatin–Mackenzie boundary south of the Arctic Ocean.

The population of these inland people on the southern part of the Barren Lands during the first quarter of this century was probably around 450–500 (Birket-Smith 1929: 66). There is strong evidence from early accounts that the population was somewhat larger during the 19th century and the earlier part of this century: e.g. Tyrrell estimates from 500–600 Eskimos were resident along the Kazan River in the late 1800's (Tyrrell 1897: 167).

Following widespread starvation among the various bands in the winter of 1957–1958, the nomadic inland people were variously relocated to the coastal settlements of Cambridge Bay or Gjoa Haven on the Arctic coast, to Ranklin Inlet, Eskimo Point or Whale Cove on the west coast of Hudson Bay, or to Baker Lake inland on the Barrens.

The data for this report were obtained in 1974 from several Ahiamiut and Utkusiksalingmiut people now living at Whale Cove and Rankin Inlet. The subsistence methods and land use patterns described were practiced during the 1940's or 1950's.

This paper is divided into two sections. The first will be a description of the yearly cycle and the different subsistence methods utilized during each season. The second will be a discussion and anlysis of land use areas illustrated with maps showing the land used by five inland families in the course of a sample year.

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The Economic Basis of Life on the Barrens

As the name Caribou Eskimo implies, the lives of these inland people were dominated by a dependence on the Barren Ground caribou.

The average inland family, which considered of four or five members and at least as many dogs, could consume 250 caribou in the course of a year (Lawrie, in Kelsall 1968). The average total edible meat from a caribou is about 75 pounds, or less than half of total live weight. Large bulls weigh as much as 300 pounds at their fattest in September, and lose from 20 to 40 per cent of their weight through the winter. Mature females may weigh 200 pounds at their maximum yearly weight and 150 at their minimum, while nursing in the summer.

Although caribou hunting was a year-round activity and a major topic of conversation throughout the year, the bulk of the meat supply was normally killed and cached either during the herds' northward migration in May or during the migrations toward rutting grounds in late August and September. Most of the caribou population of the Barrens left the tundra in November to winter in the boreal forests to the south.

In addition to providing meat, caribou was also the source of all clothing not made from materials acquired at the trading post, viz. boots, socks, inner and outer pants and parkas. Caribou sinew was used as sewing thread and caribou antler provided material for the construction of various types of tools. Caribou fat served as an important source of fuel and hides were used in making dog traces, tents, sleeping robes and kayak covers.

The second major source of food on the Barrens was fish. Major species used were: trout, whitefish, and ciscoe which provided fat that was used for fuel as well as food. Grayling, pike and sucker were less important species that were also eaten, and those people nearest the coast had access to Arctic char in certain rivers and lakes.

In spring and summer, ducks and geese provided both meat and eggs as an occasional addition to the food supply. Ptarmigan were present throughout the year. Birds, however, were of minor importance.

Food used during famine periods included ground squirrels, and Arctic hare. Foxes were trapped as an important means of acquiring necessary trade goods.

In addition to foxes, ermines were sometimes caught in traps. The wolverines and grizzly bears were only rarely encountered and most men lived their entire lives without shooting either one of these animals. The wolves, however, were much more common, but they did not play a significant role in the economy of the inland people.

Unfortunately for the Inuit, the caribou did not always follow established routes during their migrations nor were their summer and winter ranges always the same from

year to year. As a result, most of the inland people spent much of their lives travelling in search of the caribou. Whereas the coastal people could rely on certain areas providing a rich source of food year after year, this was not the case with the inland people.

It was not unusual for a man to cover an area of 3,000 to 4,000 square miles during his life in the Barrens. In addition to this, families would sometimes move to the coast to hunt sea mammals, predominantly ringed and bearded seals, for a year or even longer if caribou were not available inland. Only one group, the Ahiamiut, remained totally isolated from the ocean. Whenever people met, whether on the land or at trading posts, conversations would center around the location of caribou and camps would be moved accordingly.

The Yearly Cycle

Though for analytical purposes separation between economic activities is useful, such marked distinctions scarcely existed in reality. Fox trapping, for example, was associated in winter with caribou hunting and occasionally with fishing; sometimes all three activities would be engaged in on the game day. It is best then not to impose the artificial idea of separate trapping, hunting and fishing occupations in a description of subsistence methods during the yearly cycle.

Fall

Fall was certainly the most important time of year in terms of subsistence, and even survival, of the inland people for this was the season when caches were made that were so vital for winter survival.

Fall began in the Barrens in mid-August when the tundra foliage turned orange and red, and freezing night temperatures soon after caused thin ice to form on the tundra ponds.

In late August, though varying from area to area, the caribou would form large herds and move north from the southern Barrens where they had congregated after the midsummer southward migrations. This fall migration was directed toward rutting grounds, and the herds often retraced the migration routes that they had followed during the northward spring migration. Herds numbered in the hundreds at this time, rather than in the thousands as during spring migration..

At this time of year, the caribou were fat after summer grazing, and their fur was in prime condition for making clothing. Because of these two factors, the caribou were more valuable and desirable during fall than at any other time of year.

Early fall camp activities were focused almost exclusively on killing and caching caribou for the winter. There was almost no fishing done by adult men during the early fall, though some fishing at fall encampments might be done by children, women or incapacitated men. There was no fox trapping at this time of year.

The early fall caribou migration routes were not entirely predictable, but in many areas of the Barren Lands the herds tended to cross rivers at or near the same place most years. These river crossing places were therefore fall hunting and camping sites. At these crossing places, huge numbers of animals could be killed in very short periods of time once the herd finally arrived there. The bulk of the work at these places was not the actual hunt, but the skinning and gutting of the animals and the building of caches.

In some areas, most notably Ennadai Lake, Inuit were very dependent on the use of kayaks or canoes and lances to kill caribou at crossing places. The caribou were struck in the kidneys and lines were attached to the antlers; then the animals were towed to shore.

In the Garry Lake area, there were not many predictable crossing areas and most of the fall hunting was done on foot. During this time of year the caribou were much less sensitive and shy than during the winter. It was normally possible for a single man with a gun to kill as many as 150 caribou in the fall, while hunting on foot and by canoe or kayak. As the caribou's sense of smell was always very keen, wind direction was all important in stalking. However, as caribou vision was not acute, by bending forward at the waist and pointing one arm towards the ground to simulate a grazing caribou, it was possible for the hunter to approach a fall herd quite closely.

Most of the fall-killed caribou were cached. The limbs and heads of the skinned animals were removed and the parts of three or four animals were then gathered together and covered with rocks to prevent, or at least discourage, wolves, wolverines and bears from disturbing the meat during the winter.

Caches of undried meat made before mid-August were used only for dog food because such caches would become infested with maggots and would rot. Meat cached after mid-August would remain well preserved throughout the winter. Cached meat did have a slightly fermented taste, and during winter people were able to tell quite accurately, by the taste, when a piece of meat had been killed. The various degrees of fermentation reduced the monotony of a diet so dominated by caribou.

The caching ended in early October when freezing prevented freeing of rocks from the ground for cache construction. For a family of five or six, a kill of 150 caribou was considered a good fall hunt.

All of the skins of animals taken from August to October were saved, either cached or kept at camp, and used to make clothes. Winter skins were usually abandoned, with the exception of large male skins which were sometimes kept for sleeping robes, made by sewing four to six skins together.

A large number of skins were used in making clothes. Each member of the family needed a complete new outfit of clothes each year as well as numerous pairs of socks, boots and mittens. It normally took two skins to make a man's parka, and two parkas were worn together during the winter. The hides for the inner parka were taken from calves killed in early August at which time the hair was shortest. A double set of knee-length pants each required one skin. These clothing skins were not tanned, but were made soft and pliable by long hours of scraping.

Men used about five pairs of boots each winter and two pairs each summer. Winter boots had soles made from the tough forehead skin of bulls and tops made from belly skin. Summer boots also used forehead skins for soles and side skin for uppers. They were made from October skins with hair removed and were waterproof. Inner socks were made from calf skins. Fewer pairs of mittens than boots were needed per year. Mittens were made from leg skin. Summer gloves were made with the fur inside.

A complete outfit for a man would take eight skins. Skins were also used to cover caches, to cover sled loads, to cover the inside walls of, and serve as doors to, snow-houses. Twelve dehaired hides were needed each February to recover a kayak.

During the fall season, in addition to making clothing, time was spent rendering caribou fat for use as a fuel. The fat, which was mostly from the back of the animal, was cut from the carcass and chewed. The chewed fat was then cooked in large pots, allowed to cool, removed from the pot in a block and placed in a cache. This fat would serve as a source of light during the long dark winter and was also eaten in warm liquid form.

Caribou mated during the month of October when freeze-up began and snow was on the ground. Bulls in rut were inedible; though edible after rut in November, by that time they had lost all of their fat.

Some journeys were made to the trading posts as soon as the rivers froze in October. The trading company policy of allowing trappers to buy on credit enabled people to trade at this season before any foxes had yet been trapped.

After most of the fall caching of caribou had been completed, some fishing was done. Gill nets were introduced to the Barrens by traders but were still not used universally even in the 1950's; no one in the Garry Lake area used nets before 1950. Nets were placed under the ice, but only during the spring and fall when the ice was less than one foot thick. Fish were not cached by inland people, as among some of the coastal peoples.

People who did not own nets fished during the open water period from shore or from either canoe or kayak with hook-and-line. Casts of up to 60 feet could be made from shore. The fish spear (leister) was also used during the fall, especially at rapids in the rivers. Some stone weirs in rivers and along the shores of lakes were still maintained and used in the 1950's, although they were used much less widely than in previous times.

Winter

By November, the majority of the caribou that summered on the Barrens would have migrated to the boreal forests where they would winter. An early winter southern migration occurred, but was not nearly as important to the people as the early fall migration.

In early winter, camp location was often a result of proximity to caches that had been made during the fall. These caches were generally located near caribou crossing spots where rivers were quite narrow. At some point along these narrows there might be rapids that remained open throughout the winter, so that a common early winter camp activity consisted of leister fishing and consumption of cached caribou meat.

During the winter four to six families often camped together. They would stay together throughout the winter if either caches or a large local caribou population provided a sufficient food source for all.

During the winter the people of Garry Lake would stay near the big lake and fish almost exclusively in it rather than in the many small lakes away from it. This was largely due to the fact that the winter caribou population tended to stay congregated near Garry Lake during the winter.

Scattered bands numbering from 10 to 50 caribou remained on the tundra during the winter in most years. At this season hunting of caribou continued with dogsled, but was normally combined with fishing and/or trapping, unlike fall caribou hunting which constituted a distinct, separate activity. If sufficient caches were made during the fall, winter caribou hunting areas were not large and caribou hunting was not vital, although fresh meat was a welcome change from cached meat even though more lean. If sufficient caches were not made during the fall, winter caribou hunting became critical, and hunting areas very large.

In midwinter when the ice was too thick for nets to be used, fishing was done with hook-and-line through holes in the six-foot-thick ice. Bait consisted of ptarmigan, or caribou gut or, most commonly, a piece of belly meat from a fish. Lake trout was the fish most likely to be caught with hook-and-line; though large, trout were lean. Grayling, ling, pike and sucker were also caught with hook-and-line but were not nearly as important as trout. A dozen fish could usually be caught in a day's angling; fishing holes could be fished out in a few hours, so for best results new holes had to be chopped often.

Healthy men usually preferred hunting and trapping to fishing with hook-and-line; thus winter fishing was an activity often pursued by other members of the camp who did not hunt, or only hunted occasionally, such as women, old men

and boys. Older people, who were more sensitive to the cold, would often fish with hook-and-line from inside a protective snow-house built on a lake.

During the winter, fishing leisters were used either at the rapids of a river where the water did not freeze, or through a square hole chisled in the ice. Fishing through such an opening could only take place in early winter when the ice was not at maximum depth, and required the use of a fishing lure, sometimes carved from ivory or from antler in the shape of a fish. An entire whitefish skin could also be used as a lure. In a good day of fishing a man would get from 15 to 20 fish using a lure and leister, with the technique used depending on the type of fish that was desired. The whitefish, and especially the ciscoe, had more fat than the other fish but would not bite a hook in winter and therefore could only be taken with the leister. Fat from these two species was used to light the snow-houses during the long dark winter, and also served as an important food.

There was one winter fishing technique that involved both the leister and the baited line. This technique involved chopping two rectangular holes in the ice. The long edge of these holes was perpendicular to the river with one being about 200 feet in front of the other. In the upriver hole was placed a weighted line with three baited hooks tied at intervals. The fish downstream would be attracted to this bait and were speared through the other hole by the waiting fisherman.

The final device used in winter fishing was a trap or set hook made by inserting a sharp caribou bone into a whitefish tail which was fastened to a sinew line, secured, and left overnight. These baited hooks were often set near camp.

During the winter, camps were always made on frozen lakes and these were nearly always lakes that had fish. Camps were not made on lakes that froze solidly to the bottom since it was the water beneath the ice that provided insulation and made snow-houses on lakes warmer than those on the land. Also, of course, the lowest spots on the terrain, and thus those most sheltered from the ever-present wind, were on the surface of lakes. The water hole that was chipped through the ice near camp was normally used as a fishing hole, although it could quickly get fished out.

Fishing was often done in conjunction with trapping. Along the Back River, trips to open-water fishing areas were often made while checking traps. Also, hook-and-line fishing was sometimes done in hunting and trapping areas at some distance from camp although usually this type of fishing occurred close to camp. In fact, proximity to a good fishing area was one of the prime considerations in selecting winter camp sites.

It is difficult to estimate what proportion of the total food supply fish provided. At Garry Lake, during a good day of fishing, 30 to 50 pounds of fish could be taken. The joint efforts of a household could probably produce at least 80 to 100 pounds of fish per week. This would be about 15 per cent the weight of the weekly food supply. Fish would normally be fed to dogs if both it and caribou meat were available. The fish take could be increased significantly when more attention was focussed on it, which was not necessarily the case with hunting caribou in the winter. This was the most significant feature of winter fishing and indeed fishing throughout the year. Even though fish were definitely secondary to caribou as a food source, their presence as a back-up food source that could be exploited when caribou were depleted was of tremendous importance to the survival of the inland people. Indeed, in many cases, families survived late winter famines, after caches had been depleted, by fishing alone. In most of these cases, however, some or all of the family's dogs were killed and eaten.

In November, trapping for the Arctic foxes would begin. Although trapping was an economic necessity to the Caribou Inuit, it was done to a lesser extent on the Barrens than along the coast. Most inland families had about 10 to 40 traps which were checked throughout the winter by a man and his son(s). If a man had no helper(s) he would likely have fewer traps.

Traps were usually set in conjunction with caribou hunting, and most hunters would carry three to four traps with them whenever they went hunting. If a caribou were killed, a trap or traps would often be set around the spot where the animal had been gutted. Sometimes whole caribou would be left as bait. Traps would also be set near caribou that had been killed by wolves and at meat caches. Almost any type of meat was used as bait: caribou, fish and even fox meat. The smellier the meat the better it was as bait. Dung was also used.

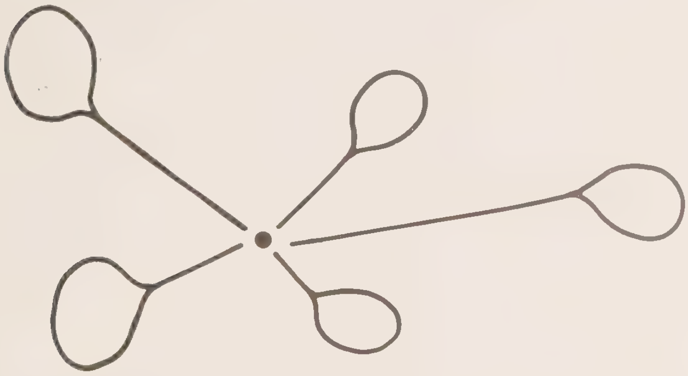
Those men possessing fewer traps largely confined their trapping to the vicinity of caches, with a single trap often set on the top of a cache. Foxes were thus trapped when they climbed the caches to mark their territory by urinating. Traps were sometimes placed around caches as well as on top. Traps were also placed at caches that had been depleted, where lingering odours continued to attract foxes. As there were always more caches than traps, only selected caches were trapped.

Those men with more traps sought out denning areas and trapped there, mostly during early and late winter when there was sufficient light during the day to locate suitable trapping areas.

Most trappers, however, set the largest numbers of traps around caches. The second largest number were set around freshly killed caribou, or by old carcasses having tracks nearby or any places where numerous tracks were seen. Trapping at dens involved the least number of traps in the course of a season. Sometimes traps were set around or inside snow-houses that had been used to store caribou.

Traps were not placed in trap lines and all were not normally checked during a single trip from camp. Instead, they

were set individually in a number of different areas surrounding the camp. Inland people commonly describe their trapping areas with the type of diagram shown; the axis being the camp.



At least twice a week, trappers would check some of their traps. However, these trips were taken largely for the purpose of hunting caribou, for traps were rarely ever set in areas that the trapper believed to be totally devoid of caribou. The placing of traps, checking of traps and caribou hunting were all done as one integrated activity. For this reason, the total trapping area of an inland trapper must be considered as coterminous with his winter caribou hunting area.

The likelihood of a man setting traps at the very periphery of his hunting area was not great because of the long distance that would have to be travelled in order to check them, but at times traps were set great distances from camp. Just as hunting areas must include all the land a man passes through in search of caribou, not merely the sites of actual kills, so too must the total trapping area include all of the land where a man was looking for trap placements rather than merely the areas of most concentrated trapping.

When hunting trips lasting one week or more were taken to distant areas, traps would be set in that area early in the trip and would then be checked and retrieved before the hunter returned home. In like manner, traps were sometimes set on trips to the trading post and retrieved on the return trip.

Traps were moved often during a season. If a trap were checked two or three times without signs of a fox having been near the trap, it would be moved. When winter camps were moved to a new area, most traps would also be moved. Forty traps could occupy 200 placements in the course of a winter. The trapping area was constantly changing size and shape.

Spring

Trapping ended in April. About this same time, or a short time later, the move was made from the winter snow-houses to summer tents.

In the spring (after the move into tents) families usually travelled together looking for caribou, for the weather in late April and May was pleasant and considered safe for children to travel. Any caribou meat remaining in caches at this time of year began to rot in the spring heat. This fermented meat was considered a delicacy and a welcome change from the monotony of the winter diet. It was at this time of year that many different small lakes were fished. Fishing through the ice in May was a major activity between the end of trapping and the time when the caribou migrated north from the boreal forests. Some caribou were taken during this period and the skins used for tents, kayak covers and water-proof, hairless summer boots.

In mid-May the majority of the caribou population began arriving back on the Barrens after wintering in the forests. The caribou favoured movement across the still ice-covered lakes and along snow free ridges running northward toward their calving grounds.

In the spring, caribou meat was cut into strips and dried on rock out-croppings or on a layer of twigs on the ground. After the meat was dried, large quantities would be stored in semi-subterranean caches. The construction of these caches varied from group to group and in some areas large caches were constructed for use each year, whereas in other places new caches were built each spring in new locations.

To construct such a pit cache, a rectangular hole was dug to a depth of two or three feet. The floor of this hole would be lined with rocks or logs, and pieces of dried meat placed on top. Among the Ahiamiut of Ennadai Lake, choice pieces of dried meat would be put into large bags made of whole caribou skins and placed on top of the loose meat. The pile of meat would extend about three feet above the ground. A layer of sticks tightly packed together was placed on top of the rounded pile of meat and then a layer of flat rocks was placed on the top in order to keep the meat from getting wet during summer rains. If the meat got wet or if it were cached in the spring without being thoroughly dried, it would become maggot-infested. The spring caches at Ennadai Lake were 10 feet long, six feet wide and seven feet in depth. Some caches are said to have contained 50 caribou. However, fewer caribou were cached during spring than fall: around 50 caribou per family were considered a good spring hunt.

Summer

After this period of intensive caribou hunting, in spring, fishing and bird hunting became significant seasonal activities. Egg gathering and berry picking were also summer activities.

Caribou hunting continued throughout the summer, with the meat being dried. Caribou hides were useless during the summer due to the activity of warble flies which bored holes through the hide in the summer months.

In late July, the caribou once again formed huge herds and migrated south; though animals could be killed at this time of year, any meat that was not quickly cut in strips and dried, soon spoiled and became infested with maggots. As a result, large kills were not usually made, and when large kills were made there was usually a good deal of spoilage.

Families normally lived alone during the summers and walked across the tundra hunting and fishing. Kayaks, and also canoes bought from the trading stores were used for transportation, and for those who had nets, for fishing also. Some stone weirs were used in fishing with the leister, but by the 1950's they were only in limited use.

As mid-August arrived, so too did the caribou and preparations for the long winter were begun once again.

Land Use Areas: Discussion and Analysis

In this second section, five maps will be presented, each showing the land use areas of a single nuclear family during its movements in the course of a year.

A differentiation is made between land used during the period of snow cover when rivers and lakes were solidly frozen (early October to mid-June) and the snow-free period of open water (June through September).* This distinction is made for logistic reasons, as ease of dogsled travel during the frozen period is in sharp contrast with difficulty of movement during the ice-free period when the land is divided by the innumerable lakes, streams and rivers.

It was during the winter trapping months that the most extensive land use occurred, for during this season journeys of great length would be made to trading posts. For example, many of the people who lived at Garry Lake traded at Baker Lake and at the post on Perry Island in the same winter; each of these posts was about 150 miles, southeast and northwest respectively, from Garry Lake.

While travelling, men were always alert for signs of animal life. However, during these trading visits hunting was incidental and game would usually only be pursued and killed if it could be done with a minimum loss of time and energy, as enough meat for the trip was normally carried on the sled. Any game killed on the trip toward the trading post would often be left, and then collected on the return to camp. No fishing occurred on journeys to the trading posts.

This extensive but low intensity pattern of land use occurring during the long trading trips accounted for a large proportion of the total winter land use among the Garry Lake people.

The inland Padlirmiut, who traded into the Padlei post, used a smaller area more intensively due to the relative proximity of posts within their territory. The Ahiamiut, in the Ennadai Lake area, had access to the inland posts at Nueltin Lake and Padlei, but also undertook long journeys to Brochet and Churchill in Manitoba.

In calculating hunting areas used during trading trips in the five following cases, the distance to the post from the edge of the normal land use area was multiplied by four, presuming that a man was able to see caribou that were within a two mile radius of his travel route. Calculations also presume that if more than one trip to a single trading post were made, only one route was used.

Aside from trips to the trading post or trips to the coast for winter hunting at the seal breathing holes, a hunter would have used between 500 to 1,000 square miles of territory in the course of a normal winter season; largely different but similar-sized areas were often used in successive years. The amount of land used in a winter would also relate directly to the amount of food obtained in the fall and the distribution of caribou during the winter. Thus, if a family had a sufficient quantity of caribou cached, it might spent the entire winter close to its supply, only killing those caribou coming near to its camp. If all the caches were in a single area, as would be the case after very successful fall hunting at a river crossing, the family would not have to move during the entire winter. If caribou had been caught in several different areas, then two or three camps might be occupied in a single winter.

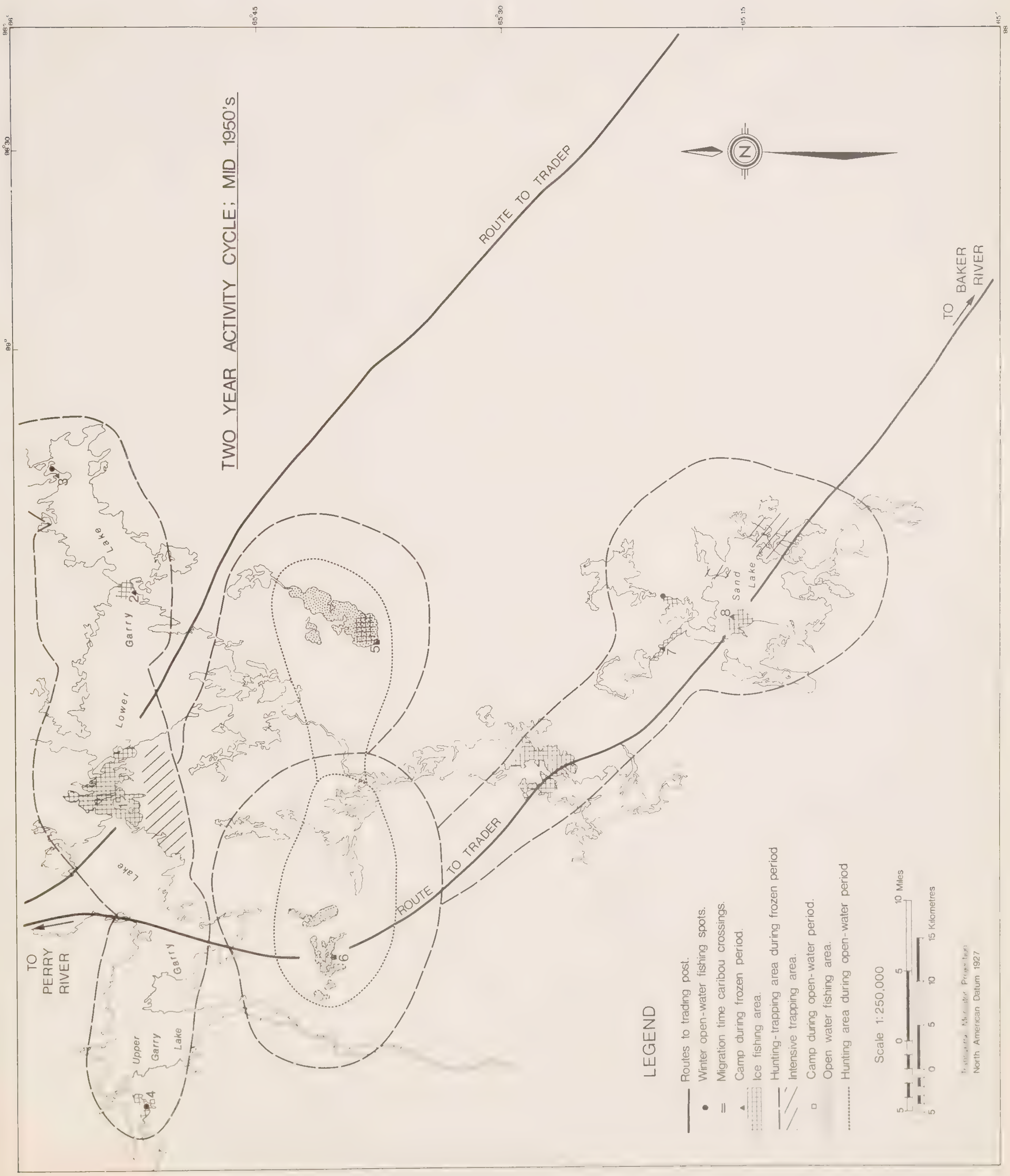
On the other hand, if fall hunting had been poor, food would be in short supply and a hunter would be obliged to travel more, in response to information obtained from others concerning caribou distribution. In times of shortage, a hunter was often away from camp, alone or with a partner, up to a week before returning with food, or to move his family to newly discovered hunting grounds.

During the open-water months, less area was covered due to the difficulties of travelling. However, areas used during the open-water period were much more productive per square mile than were winter hunting areas. In fact, about 80 per cent of the yearly caribou supply was obtained during the open-water period. On the maps shown (with one exception) open-water land use areas are from 13 to 26 per cent the size of lands used during the frozen period. This indicates that for four of the five maps shown, land used during the open-water period was from 15 to 30 times as productive as land used during the frozen period.

The camps indicated on the maps are places where the family resided for a period of several weeks or more. Numerous other campsites were established by hunters on extended hunting trips lasting from a few days to two or three weeks.

*The arrival of snow did not coincide exactly with the arrival of solidly frozen ice nor did the melting of snow coincide exactly with the break-up of the ice. Snow usually preceded solid ice in the fall by about three weeks and snow usually melted in the spring three to four weeks before the break-up of ice in the rivers. The break-up of ice in lakes came still another week or two later.

Map 58
Garry Lake–Sand Lake land use



These "out-camps" are not shown except on one map where three campsites of this nature were re-used several times.

Intensive trapping areas are marked on the maps: these are merely those areas considered especially productive. The trapping area is otherwise coterminous with snow cover period hunting areas.*

Land Use at Garry Lake and Sand Lake

Map 58 illustrates the movements of a Garry Lake family during the mid-1950's. This family had only one hunter, who spent about as much time fishing as he did hunting and trapping during this particular winter. A two year cycle is shown beginning with a winter camp on Garry Lake marked camp "1". Four families shared this camp. Caches had been made in the area during the fall.

The women and children of the group stayed at camp 1 throughout the winter, but there were three outlying camps (2, 3, 4), where the men went, in groups of two or three, to hunt, fish and trap. Each of these camps was located at a spot with a rich supply of fish. Camps 3 and 4 were located at areas which had open water throughout the winter, so that extensive fishing with the leister was carried out at these two locations. Trips to these "out-camps" lasted for approximately one week. During the winter, trading trips were made to both Perry River and Baker Lake. Six days of travel were required to reach Perry River and seven days to reach Baker Lake.

Caribou were not very plentiful around the lake during this particular winter. Fox trapping was done throughout the caribou hunting area, with most extensive trapping in the immediate vicinity of food caches near to camp 1.

In early April, the respondent and his family moved from camp 1 by dogsled toward camp 5, establishing numerous temporary tent camps and hunting caribou en route. After about one month of travel, they established camp 5 where four other families were living.

This particular family had no boat at camp 5. Although some fishing was done, dried caribou was the staple of the diet, with birds also being an important food source.

After about four to six weeks at camp 5, the family began walking overland toward camp 6. Caribou were cached in the vicinity of camp 6 throughout the fall, the head of this household hunting alone using a rifle.

With the onset of winter, this family remained at camp 6 and moved from their tent into a snow-house. Trapping commenced near the camp, and in winter a trading trip was made to Perry River.

Table 10
Areas utilized by one family during two sample years in the Garry Lake and Sand Lake region

First year	Square miles
Snow cover period hunting-trapping area	675
Snow cover period fishing area	12
Snowless period hunting	175
Snowless period fishing	15
Total normal hunting and trapping area	675
Total fishing area	25
Additional land used during trading trips	1,160
Total	1,835
Second year	
Snow cover period hunting-trapping area	706
Snow cover period fishing area	10
Snowless period hunting area	105
Snowless period fishing	6
Total normal hunting and trapping area	706
Total fishing area	16
Additional land used during trading trips	1,080
Total	1,786

In late winter the hunter went to trade at Baker Lake. During this journey he discovered a large herd of caribou around Sand Lake. After returning from trading, he moved his family and the remaining cached food to camp 7 near Sand Lake.

The family later moved to camp 8 in the same area. Fishing was carried out during early spring, using a net in the open-water area shown to the north of camp 8. Then, during late spring, the family moved back to camp 5, and spent the summer and fall in the same area that they had occupied the previous fall (Table 10).

Land Use at Armark Lake

Map 59 illustrates the land use area of a one hunter family for part of a year beginning during the late summer of 1945. A large area around camp 1 was hunted on foot and by canoe. Caribou were not plentiful and only about 50 were killed and cached during the fall.

In early winter the family moved to camp 2. Caribou were not plentiful here either, and only about five were killed while

*The trapping areas are not exactly coterminous because the frozen period hunting-trapping areas include land covered by dogsled in late October and early November before trapping and also land covered after trapping in late April to early May. However, these frozen period non-trapping areas were limited enough to justify the use of the label "hunting-trapping".

Map 59
Armark Lake land use

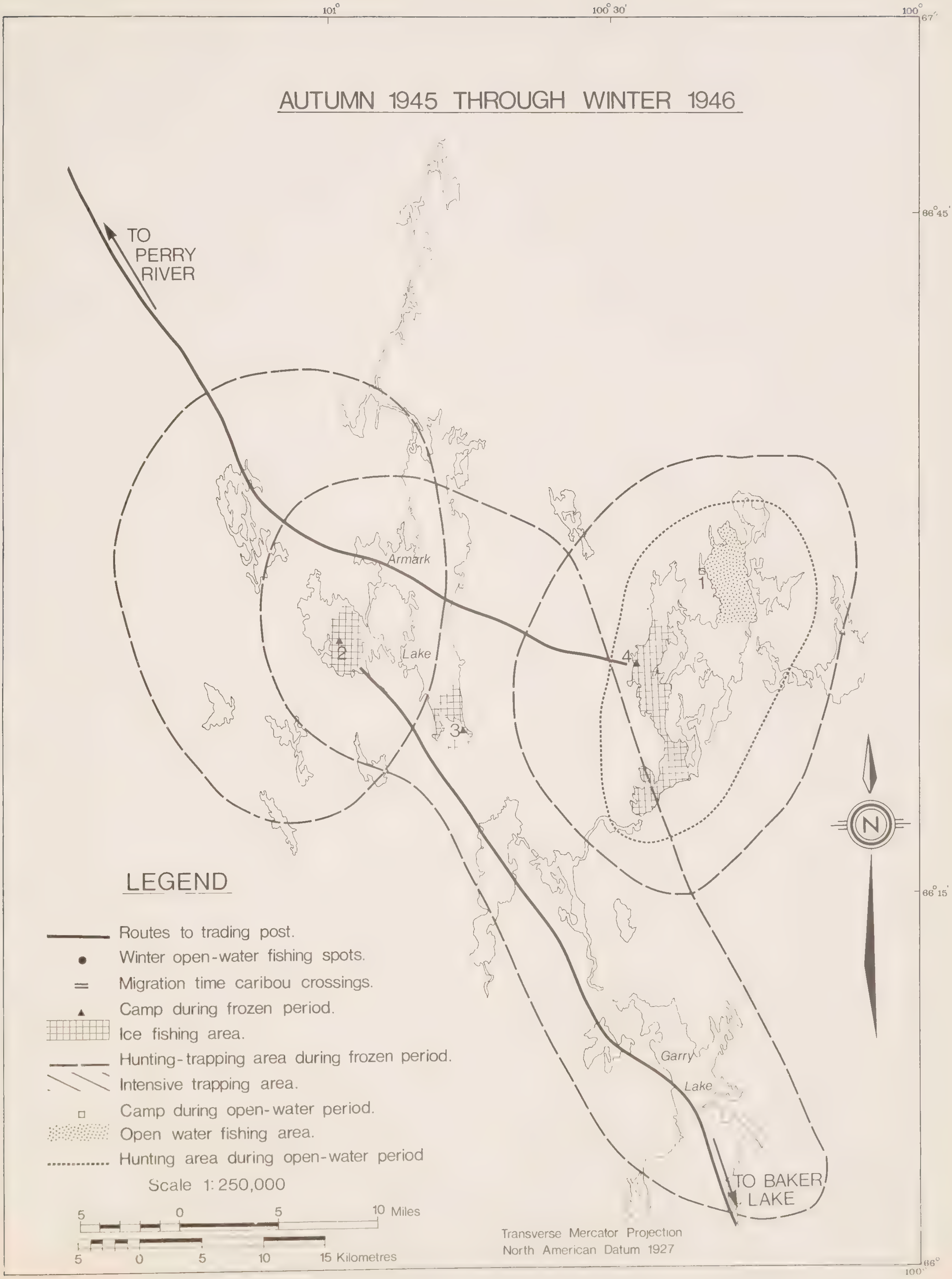


Table 11
Areas utilized by one family during part of one year in the Armark Lake region

	Square miles
Snow cover period hunting and trapping	887
Snow cover period fishing	16
Snowless period hunting	136
Snowless period fishing	8
Total normal hunting and trapping area	887
Total fishing area	26
Additional land used during trading trips	1,080
Total	1,967

Table 12
Areas utilized by one family for part of one year in the Deep Rose Lake region

	Square miles
Snow cover period hunting and trapping	300
Snow cover period fishing	44
Snowless period hunting	185
Snowless period fishing	36
Total normal hunting and trapping area	450
Total fishing area	52
Additional land used during trading trips	400
Total	850

the family resided at this camp. Fishing through the lake ice near camp occupied as much, or perhaps more, time as did hunting and trapping. A trip was made in January to the trading post at Baker Lake.

The family moved to camp 3 after this trading trip. Fishing through the lake ice continued to provide a large part of the food supply. One long hunting trip was taken to the south; however, this was not successful as only Arctic hares were killed during the trip.

At camp 4, cached caribou provided food, though fishing again was the major subsistence activity. In late winter with the situation becoming desperate, the head of the household went to Perry River to trade and to gain information about the location of caribou. After returning from Perry River, the man moved his family to an area to the west (off the map), where caribou were reportedly to be found (Table 11).

Land Use at Deep Rose Lake

On Map 60 is shown a seasonal land use cycle beginning in the early winter of 1950. The respondent lived throughout the winter at camp 1 from where he hunted and trapped with his father and brother with whom he shared a snow-house. This family had not been able to make caches of caribou meat during the fall and so were dependent on the winter caribou population for their food supply. Fortunately, a herd of caribou remained close to Deep Rose Lake throughout the winter and so the family obtained sufficient food. Two trading trips were made to Baker Lake during the winter.

The respondent made several overnight trips of from two to four days to a small lake northeast of camp 1 and also to an arm of Lower Garry Lake. At Garry Lake he fished with a leister in two areas where the water did not freeze, and at the other lake he fished with hook-and-line. During these trips this man hunted caribou and trapped, using about 20 traps.

The family remained at camp 1 during the spring and early summer, fishing on the lake and hunting caribou along the shore line.

In late summer, the family moved south on foot, hunting caribou and making caches. The family stayed at camp 2 for about 10 days and at camp 3 less than a week. Six caches were made between camps 2 and 3. They remained at camp 4 throughout the fall. About 30 caches were made at camp 4 and another 10 were made in an area south of this camp (Table 12).

Land Use at MacAlpine Lake

Map 61 illustrates land use during one year for a one hunter family living near MacAlpine Lake during the late 1940's. This cycle begins in fall at camp 1. Camp 1, occupied by three families during fall, was a caribou crossing spot where caribou were shot and cached. Four miles to the west of camp 1, was a second caribou crossing area where hunting was done with kayak and lance, as well as with rifles. These two crossings were the focal points for hunting at camp 1.

This particular fall the respondent was only able to make about 30 caches, each containing three or four caribou. Sixty caches were considered a successful outcome of fall hunting.

The family stayed at camp 1 when winter came, and fed mainly from the cached fall-killed caribou, though they also had food from spring caches located in this area.

Fishing was done with hook-and-line to the west of camp. The caribou crossing, where water did not freeze, was an

Map 60
Deep Rose Lake land use

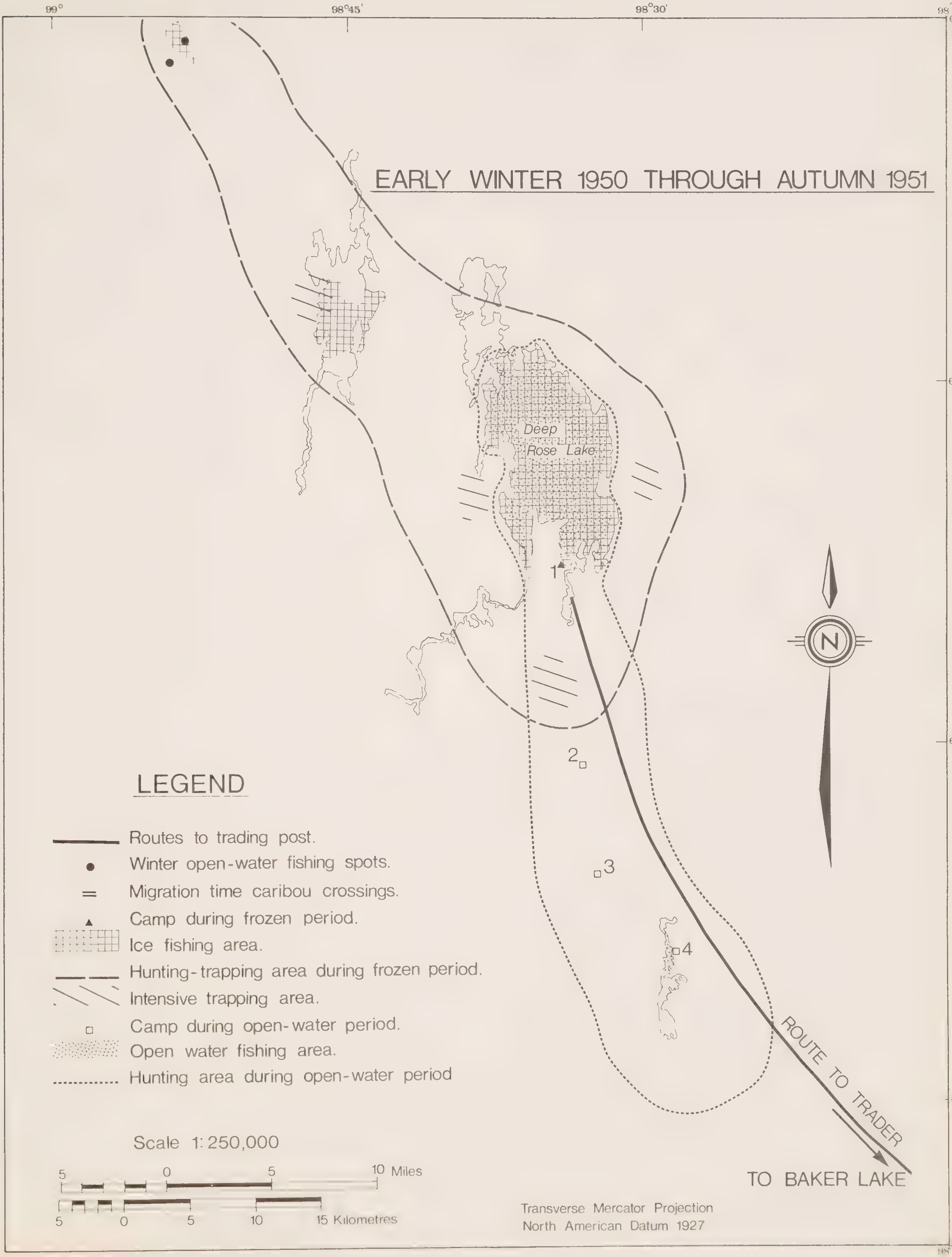


Table 13
Areas utilized by one family through one year in the MacAlpine Lake region

	Square miles
Snow cover period hunting and trapping	525
Snow cover period fishing	6
Snowless period hunting	69
Snowless period fishing	7
Total normal hunting and trapping area	528
Total fishing area	8
Additional land used during trading trips	400
Total	928

area where extensive leister fishing for whitefish and ciscoe was done.

During the early winter there were not any caribou around camp 1, so the men went out on two to four day hunting trips to the east of this camp to augment the meat supply from the caches. Caribou from these hunts were brought back to camp. Five caribou killed on one of these hunts was considered a good result. Most of the caribou were shot near the two lakes on the far perimeter of the hunting area.

The respondent also made a 100-mile trip to the trading post at Perry River early in the winter. He did not kill any game during the trip. Trapping was carried out in the vicinity of camp 1 using 10 traps.

Later in the winter, when the caches ran out at camp 1, the family described moved with two other families to camp 2, which was an area where caribou were more plentiful at that time of year. Extensive hunting and trapping was carried out to the south of this camp.

In late winter the three families moved to camp 3 bringing about nine caribou with them. Fishing through the ice was a more significant activity at camp 3 than it had been at camp 2. From this camp the head of the household made a second trading trip to Perry River.

In the spring, migrating caribou passed close to camp 3. Many caribou were shot and their meat was dried. Dried meat was stored in semi-subterranean caches. Fishing through the ice with hook-and-line was a secondary activity of relatively little significance at this camp. No trapping was done at camp 3 because the trapping season was now over.

In late spring, the move was made to camp 4, on the mainland, which was a tent camp. This family owned a canoe, which had been obtained at Baker Lake, and which was used for hunting caribou and for fishing. As they had no net, they were limited to hook-and-line fishing.

In July each of the three families dispersed; this particular family walked toward camp 5, hunting and camping along the way. They spent the summer at camp 5, where the hunter walked throughout the area around the camp, hunting and caching caribou for the winter. Fishing was largely ignored.

During the fall, the family walked to camp 6 where hunting and caching continued.

When the lakes and rivers froze, the family retrieved their cached sled and moved to camp 7.

During the following winter, the area used was approximately the same as that used the previous winter (Table 13).

Land Use at Dimma Lake

On Map 62 is shown the year-long cycle of an Ahiamiut family, beginning in the spring of 1953. There were two hunters in this family, a father and his son.

Camp 1 was a tent camp at which only this one family resided. In late May as the northward caribou migration occurred the major activity at camp 1 was hunting and drying caribou meat which was then stored in permanent subterranean caches located near the camp. Approximately 50 caribou were cached.

The family remained at camp 1 throughout the summer. From mid-July to mid-August there were no caribou in the area. During this time, the men spent most of their time fishing in Dimma Lake with a net that they set by kayak. At the northern end of the fishing area there was a narrow shallow spot where fishing with the leister was carried out.

Caribou returned to the region in mid-August. At this time, the family moved to camp 2 which was close to a known caribou crossing. Here, caribou were lanced from the kayak as they crossed the water. Limited net fishing was continued at camp 2.

In September the family moved to camp 3 and later to camp 4. At both of these sites the caribou hunt was the major activity. Hunting occurred at the crossing places and also on short one-day hunting trips made on foot.

In October the family travelled to camp 5 by kayak at which location three other families were camped. The four families remained together throughout the winter.

Water travel was still possible in early October and kayak trips were taken along the shore in search of caribou. Also, a week-long hunting trip on foot was taken to the area east of the lake. Non-breeding male and female caribou were killed during this trip and cached.

In November, the family retrieved its cached sled and moved into a snow-house. Caribou hunting continued, but at a more leisurely pace than in the fall. The major source of food during the rest of the winter was cached caribou.

Map 61
MacAlpine Lake land use

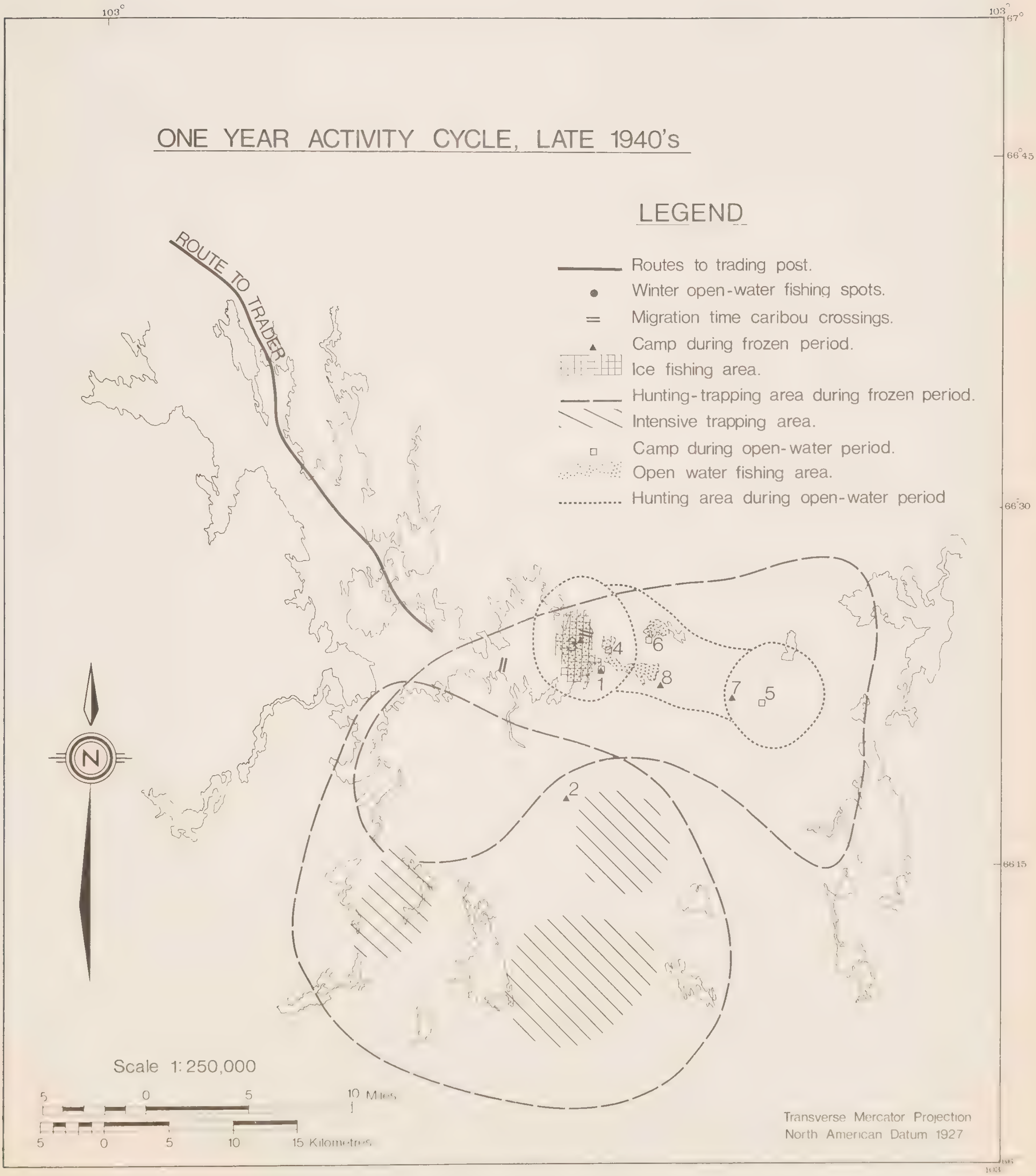


Table 14
Area utilized by one family through one year in the Dimma Lake region

	Square miles
Snow cover period hunting and trapping	518
Snow cover period fishing	3
Snowless period hunting	137
Snowless period fishing	13
Total normal hunting and trapping area	518
Total fishing area	13
Additional land used during trading trips	120
Total	638

During the trapping season, the family used about 30 traps with father and son cooperatively checking them. During the first part of the winter, hunting and trapping were confined to the area close to the lake. Later in the winter, hunting and trapping were also done in the region to the west of the lake. The most intensively trapped areas were near the caches close to camp and the denning area indicated, which was about 10 miles west of camp 5.

Several trading trips were made to the D.O.T. weather station at Ennadai Lake throughout the winter. No caribou were killed during any of these trips.

When spring came, camps were established at 6 and later 7. Caribou were hunted at these two camps as in the previous spring.

This map indicates less movement compared to that shown on the Garry Lake maps. All of the permanent camps for this year were within 10 miles of each other. The movements of the caribou in this particular area were normally much more regular than at Garry Lake, and thus allowed a more intensive use of the land.

The family described on this map lived in the same area for almost 20 years. The son was born at the location indicated as camp 6. During the year following the one described, the family moved to the northeast arm of Ennadai Lake and remained there for two years, before travelling extensively for the next two years searching for the now diminishing herds of caribou. After that, the family was evacuated to Eskimo Point (Table 14).

Concluding Remarks

The land use map biographies prepared for the Inuit Land Use and Occupancy Project by many inland-oriented hunters resident in the Keewatin region differed significantly in appearance from those map biographies prepared by Inuit hunters living elsewhere in the north and having the more usual sea mammal hunting orientation.

One purpose of the present investigation was to ascertain the nature of seasonal land use activities among inland-oriented Inuit, more especially to better understand the claim of some respondents that there was no meaningful way to distinguish between lands and waters used for hunting, trapping and fishing as separate and distinct land/water use areas.

As a result of this research program based on field interviews with representative and knowledgeable hunters in two Keewatin communities during the summer 1974, the following conclusions can be stated:

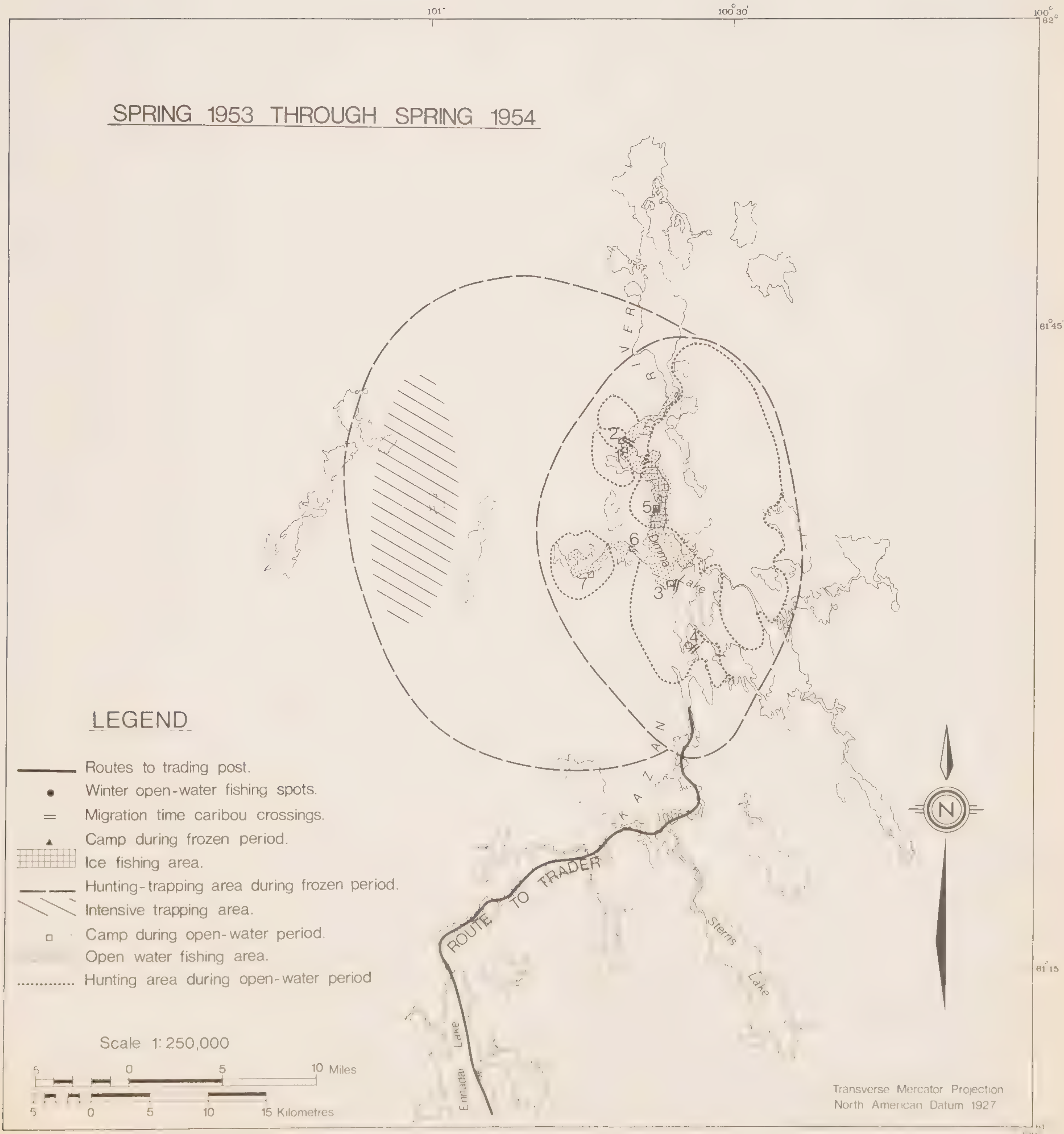
1. That locations designated "hunting" areas are primarily areas in which caribou were sought, but were also areas in which certain other land animals were obtained in season.

2. Areas used for trapping can properly be regarded as coterminous with hunting areas due to the dispersed nature of trapping on the Barrens and the dependence of trapping on butchering or caching at caribou kill sites and/or human habitation sites. Locations for setting traps, if other than associated with caribou kills (as for example, in denning areas), were usually discovered in the course of travel associated with caribou hunting.

3. Fishing could take place almost anywhere over the area designated as a "hunting" area (though rarely, if ever, along routes primarily followed for purposes of trade that only secondarily served as hunting locations). For the most part, however, fishing occurred at certain specific locations associated more especially with habitation sites or special areas where, for example, open water occurred during the winter months. Such defined areas comprised from 1.5 to 11.5 per cent of the total land/water area used in any given area. The figure 11.5 per cent appears non-representative, and on the basis of the five other sample values available (ranging from 1.5 to 4.0 per cent), it seems likely that the mean and median value of about 2.5 per cent reflects more properly the proportion of total land/water area used specifically for fishing.

4. There is good correspondence between size of total annual land/water use area in the northern part of the Barrens for each of the five sample years. The land/water use areas ranged from 850 (for somewhat less than a total year's use) to 1,967 square miles, with an average of 1,473 square miles. In the southern Barrens, the single figure

Map 62
Dimma Lake land use



available (638 square miles) supports the qualitative assessment of respondents that in the southern Barrens the greater importance of fall caribou hunting at the crossing places results in less mobility during a greater part of the year for residents of that region.

References

Birket-Smith, Kaj
1929 The Caribou Eskimos: material and social life and their cultural position. *Report of the Fifth Thule Expedition 1921–24*, v. Copenhagen.

Kelsall, John P.
1968 The migratory barren-ground caribou of Canada. *Canadian Wildlife Service,* Monograph 3. Ottawa.

Tyrrell, J. Burr
1897 Report on the Doobaunt, Kazan and Ferguson Rivers and the northwest coast of Hudson Bay, and on two overland routes from Hudson Bay to Lake Winnipeg. *Annual Report of the Geological Survey of Canada,* 9 (n.s.). Report F: 1–218.

Additional pertinent information can be found in the following two accounts of life on the southern Barrens during the time covered by this report.

Harrington, Richard
1954 *The face of the arctic.* London, Hodder and Stoughton. Pp. 135–149.

Philippe, Jean
1974–1975 Diary of famine. *Eskimo,* 31st Year, Number 8: 3–11.

Biological Productivity of Arctic Lands and Waters: A Review of Canadian Literature

by Everett B. Peterson*

Introduction

Man, like all animals, is wholly dependent for his life upon the productivity of plant and animal communities. All human food ultimately comes from green plants which grow by fixing the energy of sunlight, although often the food produced by plants is converted by animals to meat before it is harvested by man.

The first purpose of this paper is to define biological productivity in plants and animals, and secondly to review the published information concerned with such biological productivity in the Arctic region of Canada – a region that is well publicized as one of low productivity. The objective is to outline the main environmental controls over Arctic biological productivity, to compare it with productivity in more southerly habitats, and to indicate how much variability of productivity there is from place to place north of the treeline in Canada and in Arctic waters.

This paper is based entirely on a synthesis of scientific publications rather than original research by the reviewer. It is not a scientific paper to convert all northern productivity data to some common base so that the productivities of Arctic seas, lakes, rivers and land can be compared with one another. For one thing, there is not information available yet from enough places in the Canadian Arctic to allow that to be done, and where there is information it is often not standardized in a way to allow productivity comparisons to be made between different reports. Secondly, such standardized comparisons are the task of scientists who will summarize the results of detailed studies such as those carried out by the International Biological Program. This paper is intended, instead, as a general review for the non-scientist interested in the vital links between biological productivity and human welfare in the Canadian Arctic.

What is Biological Productivity?

Productivity is a measure of the rate at which communities of plants and animals bind energy into various kinds of organic material. The energy comes from sunlight. The organic material can be things harvested directly by man such as meat, berries or leaves. Organic matter can also be in the form of plant and animal parts that are not used by man but which serve as food for microscopic plants and animals. These small organisms break down this unharvested material and return its chemicals to the soil and water for use by future generations of plants and animals. In these ways, biological productivity is a link in the chain that starts with sunlight and ends with the harvest or the rotting of plant and animal material.

The chain of events in biological productivity involves three major groups of living things – plants, animals and decomposers. It is important to understand the special role that each of these three groups has in the web of life. The feature that gives plants their special role is photosynthesis, the process by which plants start with sunlight, water, carbon dioxide and nitrogen compounds, and from these manufacture foodstuffs. Because plants are the first link in converting energy from sunlight into energy in the form of organic material, they are called primary producers. Plants are the only primary producers, and organic material made by plants (leaves, seeds, berries, stems and roots) is called primary production. Animals eat this plant material and their special role in biological productivity is to convert it into other forms of organic material (meat, blood, blubber, bones and fur). Animals are called secondary producers. An important feature of animals is that many of them can digest fibrous forms of plant materials that man could not digest or use directly. In this way there can be biological productivity which can be used by man on lands that are not suitable for agricultural crop production. The special productivity feature of the third major group of living things – the decomposers – is that these microscopic organisms (bacteria and fungi) can use the carbohydrates that plants and animals have made and by adding nitrogen can produce protein. Plants, animals and decomposers all have other roles in nature but these are their specific roles in relation to biological productivity. The biological steps involved in productivity can be taken as a law of nature. We need to know how to work with – not against – such laws of nature when we use and manage the biological production of northern lands and waters.

Another important biological law involved in this chain of events is the loss of energy (or organic matter or protein) that takes place at each link of the chain. In round numbers, if you started with 1,000 pounds of plant protein contained in the leaves, buds or bark of grasses and willows, and if these 1,000 pounds of plant protein were eaten by Arctic hares there would only be about 150 pounds of new animal protein produced from the 1,000 pounds eaten. Carrying it another step further, if this 150 pounds of protein, in the form of young hares, were eaten by snowy owls about 20 pounds of new protein, in the form of owl meat, would result. And if 20 pounds of owls were used as dog food only about two pounds of protein would be formed in the bodies of dogs. This means that the longer the food chain the less protein (or energy) you get from a harvest at the end of the chain. In this example, only about 20 pounds of protein, out of the 1,000 pounds that we started with, was available to the last consumer, the dogs. Of course, along the way the 1,000 pounds of plant protein had supported other parts of the food web, the hares and the owls.

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This example shows that nature is not very efficient in its use of energy, especially if the food chains involve several different steps. This is one reason why it is so important to know about the rates of natural productivity of plants and animals. Other reasons why biological productivity is important to man will be outlined next.

Why is Biological Productivity Important?

It has been suggested that in their dependence upon Arctic wildlife, the Inuit are unique compared to other hunter-gatherer peoples of the world, most of whom rely more on plants than they do on wild game (Bliss *et al.* 1973: 379). The Inuit economy has evolved primarily in association with animals of the Arctic coastal environment which means that they are tied to the reduced ecological efficiency that goes with harvesting organic material from secondary producers (animals) rather than from primary producers (plants).

In practical terms, the long-term animal harvest from an area of several thousand square miles will depend not only upon the productivity of that area but also upon whether the harvested animal is close to the starting end of the food chain (a plant-eater) or is dependent upon the less efficient consumption of other animals. In this context, it is important to distinguish between productivity and harvest yield. What man takes is not the total productivity, but a yield – a fraction of productivity that can be removed without destroying the basis of the productivity. Man can harvest about 30 per cent of primary production when plant material is taken as grain or as wood, but the yield is reduced to a smaller fraction of the primary production if a herbivore (plant-eating animal) is harvested and even lower if a carnivore (meat-eating animal) is harvested (Whittaker 1970: 97). It is obvious, then, that yield is dependent not only upon biological productivity but also upon the point in the food chain from which the harvest is taken. Yield can go on indefinitely as long as the harvested fraction represents a surplus above the individuals needed to maintain the population.

There is another point to note about northern biological productivity by relating it to systems of food production in southern latitudes. This perspective is important because there is a tendency to think that it is best to produce all human food in the south where productivity is higher and where agriculture is well developed, to import the food needed in the north, and then not worry about the limitations of Arctic biological productivity. The first thing to ask about this approach is, "what is the energy cost of different ways of food production?" Aside from the energy cost of moving food from one place to another in the world, there have been predictions that we may not be far from the day when food will become a political weapon. With rising fuel costs and an increasingly hungry world, there is no long-term guarantee that we will always be able to carry the necessary food into the north. Furthermore, present energy supply problems bring into question the extravagant use of energy in the North American food production system. Further increases in food production from increasing energy inputs will be harder and harder to come by. It is estimated that to feed the entire world with a United States type of food system almost 80 per cent of the world's annual energy expenditure would be needed just for the food system (Steinhart and Steinhart 1974: 312).

The message here is simple. In an energy scarce world, and a hungry world, the option for a hunting and gathering food system will become an increasingly precious option. The hunting and gathering method of food production provides about 10 calories of food for each calorie of energy invested. In contrast, industrialized food systems require five to 10 calories of energy (fuel) to obtain one food calorie. Feedlot beef needs about 100 times more calories of energy subsidy per calorie of food output than is required for a hunting and gathering economy (Steinhart and Steinhart 1974: Figure 5).

It is especially important, therefore, that we understand the controls, the limits, and the regional variability of natural biological productivity of Arctic lands and waters. Some of these aspects of biological productivity will now be examined for marine, freshwater and land areas in Arctic Canada.

Biological Productivity in Northern Seas

Main Controls over Marine Productivity

Because abundant moisture generally implies high productivity on land, one might expect the sea to be highly productive. This is, however, generally not the case. First of all, only the uppermost part of the sea that is illuminated by sunlight counts as an area of primary production. Depth of this layer of primary production is between 30 and 120 meters in most ocean waters (Whittaker 1975: 88). In the sea, as on the land, the basic production is at the plant level. It is now known that temperature of the sea water is not an important control over marine productivity. For example, the Antarctic Ocean is one of the most productive seas in the world and the Arctic Ocean is the least productive, yet they have similar water temperatures. Internal adaptations of marine animals to low water temperatures is one reason why temperature is not as strong a control over productivity as one might expect (Dunbar 1957: 798ff).

The main control over marine productivity is the degree of vertical stability of the water layers. The deep waters of all seas, including the Arctic Ocean, are rich in nutrients needed for plant growth (phosphates, nitrates and silicates) but to be productive this deep nutrient-rich water must be brought up

to the level where there is sunlight for production by plants. For this reason, the greater the vertical stability of the water, the less biological productivity (Dunbar 1970a: 152).

The textbook version of the ocean's food chain normally begins with microscopic plants (diatoms), through small crustacean animals (copepods and krill) to fishes and whales. However, recent studies have identified the importance of marine bacteria and fungi, dissolved organic matter, and non-living organic particles (Pomeroy 1974: 499). These could be providing other pathways through which much energy is flowing. The dissolved organic matter in the world's oceans is now known to be one of the largest reserves of organic carbon on this planet.

In the ecological cycles of northern seas, the replenishment of nutrients seems to be greatly dependent upon the excrement of seabirds, especially murres (Tuck 1970: 221). If these nutrients are not all used locally by free floating oceanic plants (phytoplankton) they are carried in currents to marine areas where upwelling brings them to the surface again.

The highly productive seaweed zones that occur on ocean shores in temperate climates (Mann 1973: 975) do not extend into Arctic regions partly because ice scour near shore provides a physical barrier to seaweed development.

At the secondary producer levels of the marine food web, productivity for a given animal at any given location can be controlled by any of a large number of factors. These controlling factors are too numerous to catalogue here and only a few examples are given below.

Biological relationships involving polar bears as the dominant member of the ice-surface fauna and tying together foxes, birds, seals, beluga whales, fish and zooplankton, are influenced by the type, age and extent of ice. More animals are observed on old ice than on young ice and this is thought to be linked to the higher nutrient levels in old ice (Mohr and Tibbs 1963). One important adaptation of Arctic marine mammals is the ability to vary their diet depending upon local food supplies. This happens with the polar bears whose diet may be seals, seabirds or vegetation. The ringed seals, too, may take food from many points in the marine food web with the result that they are common even in regions of low productivity. In contrast, bearded seals may be limited in their productivity by the lack of ice-free feeding banks in winter (McLaren 1962: 174).

Walruses winter in the open water of Lancaster and Jones sounds and Baffin Bay. The availability of food supply for walruses seems to depend upon the rate of reproduction of molluscs and other bottom fauna, and the formation and distribution of sea ice (Loughrey 1955: 9–10). However, there is still very little information available on the annual production of molluscs and other bottom-dwelling animals.

Food supply can limit secondary productivity by controlling body size of the consumer. For example, a population of beluga whales with large bodies inhabits the subarctic waters on the eastern side of Davis Strait, whereas 600 km to the west, in Arctic waters within Davis Strait, there is a population of whales with medium-sized bodies. It is thought that productivity of the winter environment is the most important factor determining the size attained by beluga whales (Sergeant and Brodie 1969: 2574).

Contrasts with Marine Productivity in Other Regions

In temperate climates, the edge of the sea is one of the best habitats for plant growth, where primary productivity may be as high as anywhere else on earth – comparable even to a tropical rain forest (Mann 1973: 975). However, the kelps and other seaweeds that provide this very high productivity extend, in quantities sufficient for commercial harvesting, only as far north as the southern tips of Greenland and Baffin Island. The absence of this very productive seaweed zone further to the north is thought to be partly a result of the scouring effects of coastal ice. This relative lack of large seaweeds in the north is one of the major points of contrast with coastlines in temperate regions. However, one important productivity feature in Arctic waters is that the limited numbers of seaweeds that do grow there have special adaptations to absorb dissolved carbon (Wilce 1967: 193). This is an important adaptation for Arctic marine waters that have such a short period (two months or less) during which there is enough light available for photosynthesis.

It is now taken as a general rule that any marine area that contains only Arctic waters (that is water formed in and coming from the upper 200 meters of the Arctic Ocean) will be very low in biological production and will not yield human food at commercial levels (Dunbar 1970a: 153). However, when we view this low productivity of Arctic waters it is useful to remember that 90 per cent of the earth's open seas – nearly three-fourths of the earth's surface – is essentially a biological desert that yields a negligible fish catch. For 90 per cent of the open seas, primary production averages only about 50 grams of carbon fixed per square meter of ocean surface per year (Ryther 1969: 72). Considering the oceans throughout the world, the rate of primary production is highly variable, being at least 100 times more productive in the best areas than it is in the least productive areas. Primary production in Arctic waters is, of course, at the low end of this productivity scale.

Regional Variability of Marine Productivity in the Arctic

There have not been detailed productivity measurements at a large number of locations in Arctic and sub-Arctic marine waters. Therefore, this section cannot provide details of place to place variability. It is possible, though, to summarize the evidence that there is considerable regional variability in

northern marine productivity and to list a few of the suspected causes of this variability.

Wherever Arctic waters meet sub-Arctic waters, the production goes up, possibly because the mixture of polar and non-polar water causes a vertical exchange of water layers and nutrients (Dunbar 1970: 152–153). These contacts between Arctic and sub-Arctic marine zones occur in Hudson Strait, off the southeast tip of Hall Peninsula, up the central part of Davis Strait and Baffin Bay, and off the coast of Alaska and Yukon as far east as Cape Bathurst. In Arctic waters, fishes are not abundant and mammals dominate the productivity sequence; in sub-Arctic waters the reverse is true.

Coastal boreal waters have populations (referred to as standing crop) of zooplankton two to nine times as great as Arctic waters when calculated on the basis of unit surface of water (Grainger 1959: 454). Even within relatively confined marine areas there can be considerable variations as, for example, in Foxe Basin where the standing crop of zooplankton is twice as great in the western part of the basin as it is in the eastern part (Grainger 1962: 382).

Despite the generally low productivity of northern marine areas, there are some situations where concentrations of green plants (algae) do occur. For example, the bottom side of sea ice may contain from 10 to 100 times the chlorophyll content of phytoplankton in an equivalent volume of sea water beneath the ice (Apollonio 1971: 41). This finding has suggested that some of the most important primary production takes place in the ice itself, especially in the spring and early summer (Meguro *et al.* 1967: 129–130). This standing crop of algae has been found to be most abundant on the underside of one-year-old ice (Apollonio 1965: 121). Although use of this crop is undetermined, it is assumed to be an important concentrated source of food for various marine animals.

In addition to geographic variation in primary production there is considerable year to year variation at the same location. Thus in Frobisher Bay, primary production in different years varied from 50 to 90 milligrams of carbon fixed per square meter of water surface per year, presumably under the control of available nitrate (Canada 1973).

Not surprisingly, other secondary producers further along the food chain also show a regional variability in their abundance and productivity. Whalers knew this, as we can see from the records of where bowhead whales were harvested most abundantly. For the bowhead whales, a marine area of above-average importance was the narrow confines of Roes Welcome Sound in summer. Further restrictions imposed by landfast ice and pack ice concentrated the hunts for these whales in the vicinity of Daly Bay and around the mouth of Repulse Bay (Ross 1974: 90–91).

Very often the feeding or breeding requirements of animals spell out certain areas of special importance. Walruses, for example, tend to have local distributions where there is bottom feeding and nearby hauling-out areas. The south and east coasts of Southampton Island and the north coast of Coats Island (Freeman 1969/70: 158) or the smallest of the Wollaston Islands (Bissett 1967: 72) are examples of such favoured locations for walruses. Similarly, for sea birds there are regional variations in productivity. The greatest concentrations of sea birds, both at sea outside the breeding season and at breeding colonies, are associated with areas of upwelling water and high productivity (Nettleship 1973: 63).

Even for wide-ranging species, such as the polar bears, there are local areas of special importance. The Nelson Head and Cape Kellett coastal area of southern Banks Island is well known as one of the Arctic's 15 core areas for denning and cubbing (Harington 1968: 7–8). Annual variations are also brought on by yearly differences in ice cover. Polar bears prefer a mixed habitat of ice and water within reasonable reach of land. This means that many bears are distributed along the margins of the permanent polar pack and in years when Amundsen Gulf and the Beaufort Sea are ice-free in summer, there are no bears around Banks Island (Usher 1970: 74).

Ringed seals have always been the basis of the Inuit coastal economy. In the western Arctic, most of the Bankslanders' seal harvest comes from ringed seals which migrate over considerable distances, unlike the ringed seals of the eastern Arctic (Usher 1970: 51). Studies made in Home Bay, Baffin Island, and off western Victoria Island indicate that complex coastlines, because of greater ice stability, are more productive than simple coastlines as far as ringed seals are concerned. At both of these locations there were areas of both low and high productivity within the same general region. For example, in Prince Albert Sound, ringed seal densities averaged 7.29 seals per nautical square mile, but there were only 0.61 seals per square mile in Minto Inlet. These differences are related to differences in ice surface and snow cover. Prince Albert Sound has large pressure ridges that collect snow and are used by seals for wind breaks and birth lairs. In contrast, Minto Inlet freezes over with little pressuring (Smith 1973a: 7).

The highly productive complex coast, with stable ice, around Home Bay had an average density of 15 seals per nautical square mile, but 15 miles from land densities were only one seal per square mile. By contrast, in the western Arctic where there are simpler coastlines and lesser amounts of stable fast ice, seals do not show the sharp drop in density with increased distance from land. Overall densities of seals are lower in the western Arctic than they are around Home Bay, with only two seals per nautical square mile off some parts of western Victoria Island. However, this same density extended for 60 to 70 miles offshore, unlike the narrow confinement of the productive zone for ringed seals around Home Bay (Smith 1973b: 124).

From observations around Ellesmere Island, in Frobisher Bay and off southwest Baffin Island, the best ice for breeding of ringed seals will have at least 35 seals per square mile basking on it in spring. These highly productive areas will generally

be on ice that is within one mile of shore and greater than one mile from open water. Ice around islands generally supports about 10 seals per square mile and ice greater than one mile offshore would support an average of five seals per square mile (McLaren 1961: 167). These estimates of variability in productivity of ringed seals would not apply to totally ice-locked areas in the central Arctic.

Biological Productivity in Northern Freshwaters

Main Controls over Freshwater Productivity

The traditional way of considering productivity, in terms of a self-sufficient ecosystem through which energy passes, applies fairly well on land, only partially to lakes, and hardly at all to running waters (Hynes 1970: 411). The productivity of a lake is not determined wholly within the boundaries of a lake; a larger area must be considered. It is known that if there is a high degree of plant cover in the drainage basin of a lake there is a high rate of production in the lake, presumably as a result of increased nitrogen added by the vegetation of the watershed around the lake (Welch 1974: 72). In one study of Char Lake on Cornwallis Island it was found that the streams and drainage basin of this lake provide 20 to 50 per cent of the nutrient requirements of the plant and animal communities in the lake (Stocker 1973: 86). In lakes, the bottom-dwelling organisms (benthos) are under the control of drift activity brought on by erosion. This is especially important in the High Arctic where it has been estimated that 99 per cent of the annual erosion takes place during the spring snow melt at which time much of the benthos may be entirely removed from their lake-bottom habitat (Hynes *et al.* 1974: 548).

Comparisons between a fertilized lake (Meretta Lake) and an undisturbed lake (Char Lake) on Cornwallis Island have confirmed that nutrients limit productivity but there are indications that Arctic lakes cannot respond as dramatically as temperate lakes do to a large addition of nutrients (Rigler 1972).

Primary production of lakes of the High Arctic has been shown to be very much controlled by the amount of light that penetrates the water. Light penetration, in turn, is influenced by the amount and duration of snow cover on the ice surface of the lake (Welch and Kalff 1974: 616).

Another way to look at freshwater productivity is in terms of the major secondary producer, Arctic char. In general, the productive capacity per unit surface area of water is greater in rivers than in lakes for Arctic char. Lake production has been estimated at one pound of char per acre per year, while river populations produce char at rates as high as 60 pounds per acre per year in similar geographic locations. These increments represent about a 10 per cent per annum increase in the population (Hunter 1966: 19).

Contrasts with Freshwater Productivity in Temperate Regions

Char Lake on Cornwallis Island has been studied in more detail than any other lake in the Canadian Arctic. It is the least productive lake on record; many lakes in the world produce more per unit area in a day than Char Lake does in a year (Kalff and Welch 1974: 635). In some of the shallow, more productive lakes studied on Southampton Island the daily rates of productivity approached those of the less productive temperate lakes, but the total amount of production accomplished per year in these northern lakes is low in comparison with lakes at temperate latitudes due to the short growth season at high latitudes (Frey and Stahl 1958: 220).

In the well vegetated, clear water areas of the Canadian Shield in Ontario, lake production is proportional to the total watershed area of the lake divided by the lake volume. This relationship does not seem to hold as well for the Arctic lakes studied on Cornwallis Island where reduced light levels apparently over-ride the influence of nutrients (Welch 1974: 72).

Some of the animals of temperate lakes may have special life-cycle adaptations if they occur in Arctic lakes and these adaptations can also influence productivity. Studies of a small crustacean (a mysid) in a lake in southern Ontario indicated that one of these animals would retain about 53 calories of production from the time of its release from the brood pouch until the release one year later of young from its own brood pouch. In Char Lake, Cornwallis Island, this same species would require two years instead of one to grow through the same growth cycle and in that two-year period would retain only 36 calories of production (Lasenby 1971). The extra energy that is required for a specific growth phase under Arctic conditions leaves less energy available (18 calories per year instead of 53 calories) for the next step in the food web.

As a final example to compare northern freshwater productivity with that further south, there is information on growth of algae in rivers on Baffin Island. The Arctic growing season for algae is very short, beginning in late June and dropping off sharply in September. However, the maximum growth rate per day recorded in a small river near Pangnirtung was actually several times higher than the daily growth rate reported from locations in England and Ontario. During the short, intense, growth period on Baffin Island the standing crop of river algae was greater than the standing crop of algae in similar freshwater systems in British Columbia, Ontario and England (Moore 1974: 56). In total yearly production, however, the northern river must still be classed as one of low productivity.

Regional Variability of Freshwater Productivity in the Arctic

Although the total annual primary production in Arctic freshwater lakes is low in comparison with southern lakes, the rate of production per unit volume of water does vary considerably from lake to lake. Production occurs at a higher rate per unit volume of water in shallow lakes than it does in deeper lakes. In the shallow lakes not only the water but the lake bottom sediments can be actively involved in the biological productivity (Frey and Stahl 1958: 220).

It was mentioned in a previous section that the control of light penetration by snow cover is a major regulator of freshwater productivity. Snow cover varies considerably from lake to lake in the area where this has been studied near Resolute, Cornwallis Island (Welch 1974: 71). Lakes in this area have their entire snow cover in drifted form, with bare areas alternating with drifts nearly one meter deep. This is in contrast with many lakes further south and even many Arctic lakes (such as those on the Truelove Lowland, Devon Island, or Lake Hazen on Ellesmere Island), where there is a thick cover of snow on the lake surface in spring. On Char Lake, much of the ice on the north end of the lake is bare in years of low snowfall. It is thought that this has an influence on lake productivity by controlling the distribution of mosses on the lake bottom. These mosses extend to a water depth of about 10 meters on the southern side but grow in water depths as great as 19 meters on the north side of the lake. There is evidence that lakes at the same latitude but with a thicker snow cover than Char Lake may not support these bottom-dwelling mosses which serve as primary producers in the lake (Welch and Kalff 1974: 616).

One can also expect lake to lake variation in productivity as a result of differences in nutrient levels. The standing crops of free-floating algae (phytoplankton) were 10 to 100 times greater in Meretta Lake which had received nutrients from sewage than they were on nearby undisturbed Char Lake (Schindler *et al.* 1974: 659).

There are, not surprisingly, marked variations in the productivities of various lakes associated with the Mackenzie Delta. The lakes in the southern part of the Delta, south of a line from Inuvik to Aklavik, are the most productive freshwater habitats of the Delta region. In the northern part of the Delta many lakes have too high a silt content to support a large standing crop of phytoplankton and zooplankton (Brunskill *et al.* 1973: 71ff). In a part of the Mackenzie Delta that has been studied in detail, along the East Channel from Inuvik to Reindeer Station, 30 per cent of the lakes were found to be rich in nutrients brought in through small channels that connect these lakes to the main channels of the Mackenzie River. The remainder of lakes are not connected to the main channels, and since many of these lakes have banks high enough to keep out spring flooding, they are not as rich in nutrients and support less freshwater vegetation. These differences in lake productivity are also important for secondary producers because migratory and breeding waterfowl favour the most nutrient-rich, and hence productive, lakes (Gill 1974: 63).

One of the unexpected features of Arctic lakes is that the small animals that live in the lakes (zooplankton) have relatively constant population levels from year to year (Rigler *et al.* 1974: 639–640). This is unusual considering that the lake ecosystems are extremely simple ones with very few species. It is also in contrast to the great population fluctuations, that are known for Arctic land animals.

Biological Productivity in Northern Lands

Main Controls over Plant and Animal Productivity on Land

Some of the most detailed studies to determine the limiting factors for primary production in tundra plant communities have been conducted near Tuktoyaktuk. In this area production was limited by a low supply of nitrogen in both lowland wet sedge meadows and in upland birch-willow-heath communities. The low nitrogen levels are mainly a result of low soil temperatures that limit decay of organic material and cycling of nitrogen from organic material. It is thought that, directly or indirectly, low soil temperature acting on various parts of the ecosystem, provides the major limitation for plant production (Haag 1974: 113). It has been argued that lack of developed soils may be more important than low temperatures in accounting for the simple and relatively undeveloped ecosystems of the north (Dunbar 1970b: 74). However, the poorly developed soils are, themselves, largely a result of low temperatures that limit the activities of soil-forming decomposer organisms.

In some parts of the High Arctic where annual snowfall and rainfall is extremely low, water supply may be a more critical factor in limiting plant growth than is the low nitrogen supply (Savile 1972: 43). And, of course, overriding all of the influences of nutrients and water supply is the fundamental controlling force in primary production, energy from sunlight. It is important to remember that it is the amount of energy from the sun that hits a plant's leaf during its growing season that determines the plant's productivity, not the total energy received from the sun over the entire year.

Before looking at some of the things that control secondary productivity by animals, it is important to note that animals can influence primary productivity in plants. This subject has been well documented for Russian tundra areas (Tikhomirov 1959; Skrobov and Shirokovskaya 1967), and also for some places in Alaska (Schultz 1964). There are numerous examples where animals transform plant communities from predominantly mosses, lichens and shrubs into more pro-

ductive grass associations. In such cases, although the influence of animals upon plant production may be very great, the effect is always very local. Alaskan tundra studies showed the great recovery potential that exists after plants were heavily overgrazed during the peak of a lemming cycle (Schultz 1964) and in Canadian tundra studies simulated grazing (clipping of the plants) was followed by normal plant production during the growing season that followed the clipping (Babb and Bliss 1974a: 554). This capability for recovery in the perennial plants of the tundra is an important adaptation to withstand use of plant material by the secondary producers.

Population cycles are a feature of much of Arctic animal life. There is speculation that these cycles are related to productivity because they might serve to distribute and release nutrients which are scarce in the tundra. Nutrients such as nitrogen and phosphorus are locked up in the leaves, stems and roots of living plants, but when the plants are heavily grazed during high lemming populations, the nutrients are redistributed in the lemming's droppings or in the droppings of foxes or owls which eat the lemmings. Annual productivity of animals per unit area of land varies greatly between the high and low phases of a population cycle. Studies of Arctic foxes in Russia indicated that in years of high numbers productivity was four or more times greater than in years of low numbers (Bannikov 1970: 126) but Canadian data do not necessarily indicate such a great variation between various parts of the fox population cycle (Macpherson 1970: 131).

For grazing animals an important feature of tundra plant production is that a very large proportion (at least half) of the plant material produced is below ground in the form of roots, and is therefore unavailable to grazers (Bliss *et al.* 1973: 369). Another important feature is that most of the primary production goes straight to the decomposers. On Truelove Lowland, Devon Island, plant-eating animals harvested only about one per cent of the primary production. The same does not hold for the next step in the food chain, involving the carnivores. In the Devon Island study, even though many of the carnivores seen on the Truelove Lowland were present there only a small part of the time and receive only a fraction of their food from there, the energy consumed annually by carnivore predators is about equal to the energy produced annually by the herbivores (Bliss *et al.* 1973: 384).

One important factor in secondary productivity is the degree of adaptation for feeding on a wide variety of plant foods. Although many questions remain to be answered, it is thought that musk-ox populations in the Arctic islands are limited by nutritional stress (Freeman 1970: 58). Although various reports have stressed the importance of wet meadows as habitat for musk-oxen, they are not necessarily restricted to wet meadows. Musk-oxen consume a wide variety of plants including woody species, flowering plants, grasses, sedges, mosses and lichens (Tener 1965: 45–47). They do not generally feed intensively in one spot in summer even in abundant vegetation.

In ecosystems where there are fairly rapid physical changes, such as in the Mackenzie Delta, the successional phases of plant community development can create very important wildlife habitats. The early stages of plant community succession along Delta channels are very productive for wildlife (Harding 1974: 6) partly because the parallel bands of vegetation result in close contact between different habitats (edge effect) with bands of willow providing important food sources near to areas of trees that provide shelter. The most dynamic plant succession in the Mackenzie Delta occurs along the convex bends of actively shifting channels where nutrient-rich soils are deposited (Gill 1973: 55) so these segments of the Delta will mark the locations of potentially high productivity.

Of even more fundamental control than the factors outlined above are the climatic changes that result from changes in ocean currents and drift-ice patterns. These are thought to have a great influence on population levels of such animals as polar bears, seals, eider ducks, whales, foxes and musk-oxen (Vibe 1967). Climatic changes in the period 1860 to 1910 have been suggested as the principal cause of decline in the populations of musk-oxen and Greenland whales, and in the extinction of the east Greenland caribou (Holloway 1970: 186). Annual variations in weather, as well as long-term climatic changes, are also important controls over animal productivity. For example, a winter drought may deprive plants and animals of a protective snow cover (McKay 1970: 45). On the other hand, heavy snows may be destructive to large mammals; in the case of Barren Ground caribou, spring blizzards are a major cause of calf mortality (Kelsall 1968: 238ff).

It is clear that the only tundra habitat type that is relatively unimportant for animals is flat lowland in winter. It is also clear that there is a correlation between those landscape types that have a wide range of snow cover types and their suitability as animal habitats. The more varied the snow cover the more species of animals that can use the area (Pruitt 1970: 20).

Lastly, it is important to note that there are very few animals that are strictly limited to the treeless tundra area. Many of those species commonly regarded as tundra animals actually depend on the forest-tundra region to maintain their populations on a year-round basis. Thus, considerations of tundra animals must also take into account the ecology of regions that may be far removed from the tundra zone.

Contrasts with Productivity on Land in Temperate Regions

Textbooks that provide comparative figures for primary productivity in the major ecosystems of the earth normally express the results in terms of grams of organic material produced per square meter per year. When such information is presented

Table 15
Primary production of major ecosystems (after Whittaker 1970)

Area	Range	Average
	Net primary productivity per unit area (dry grams/m²/yr)	
Swamp and marsh	800 to 4,000	2,000
Tropical forest	1,000 to 5,000	2,000
Temperate forest	600 to 2,500	1,300
Boreal forest	400 to 2,000	800
Temperate grassland	150 to 1,500	500
Tundra and alpine	10 to 400	140
Desert scrub	10 to 250	70
Agricultural land	100 to 4,000	650
Open ocean	2 to 400	125
Continental shelf	200 to 600	350
Seaweeds and estuaries	500 to 4,000	2,000

on a yearly basis, the comparative figures are generally similar to those shown in Table 15.

Expressed this way, on a yearly basis, tundra plant communities are clearly very unproductive. It is important to note, however, that daily production during the short growing season of 40 to 70 days in tundra areas is comparable to many herbaceous (meadow-like) plant communities of temperate regions. In some special cases there can be relatively high primary productivity in tundra plant communities. For example, the high production values for mosses in streambeds on the Truelove Lowland show that under certain conditions mosses can produce, even as far north as Devon Island, as much each year as is produced in Scottish peatlands (Pakarinen and Vitt 1973). This occurs even though the Scottish peatlands have a much longer growing season than the moss communities on Devon Island. In other plant communities, however, the marked contrasts with productivity in temperate regions is emphasized again. In a willow area on Cornwallis Island, the willow productivity was only about three grams per square meter per year (Warren Wilson 1957: 384). Yields in temperate regions are at least 100 times greater than this on the average.

Information on secondary production by Arctic land animals does not exist in a form that would allow comparisons to be made with secondary productivity by land animals in temperate regions. One of the difficulties results from the sharp differences between winter and summer conditions in the tundra region, for a large proportion of animal residents migrate to warmer regions during the winters, thus complicating the task of estimating secondary productivity per unit area or on an annual basis.

Regional Variability of Land Productivity in the Arctic

VARIABILITY OF PRIMARY PRODUCTIVITY BY PLANTS

Various scientists have stressed that the tundra is far from uniform, even though it appears to be so (Beschel 1970: 87). Net primary productivity ranges from a low of three grams per square meter per year for a willow barren on Cornwallis Island to a high of over 200 grams per square meter per year in a wet grassy site at Point Barrow, Alaska (Bliss 1970: 78). Expressed another way, the standing crop of plants increases about 100-fold from polar desert areas of the Arctic Islands to the shrub tundra of the low Arctic region on the Canadian mainland (Bliss *et al.* 1973: 367).

Within the Queen Elizabeth Islands there is a gradient of productivity with the least productive areas being the northwestern islands (Prince Patrick, Borden, Mackenzie King, King Christian, Ellef Ringnes, Amund Ringnes, Meighen and Lougheed). There is a generally higher productivity for plants and animals on Melville, Bathurst and Cornwallis Islands. On Melville Island, lush meadows are common near the coast; Bathurst Island has several well vegetated lowlands of above-average importance for musk-oxen and caribou. The Lake Hazen and Fosheim Peninsula regions of Ellesmere Island are also exceptionally productive for their latitude (Babb and Bliss 1974b: 236).

From observations on Cornwallis and Little Cornwallis islands, it is known that calcareous shale, argillaceous limestone, shale and clay form soil that is suitable for plant growth, whereas pure limestone and dolomite do not. Large areas of Devon, northeast Baffin, Somerset, Cornwallis and Prince of Wales islands are underlain by carbonate rocks and these areas are barren of vegetation. In contrast, the sandstone and siltstone of Bathurst and Melville islands support more vegetation. It has been suggested that these geological controls over growth of vegetation are one reason why more musk-oxen and caribou are present on Bathurst and Melville islands than on islands dominated by carbonate rocks (Thorsteinsson 1958).

The High Arctic contains numerous meadows that have a continuous cover of mosses, sedges and grasses. These areas of relatively high productivity are estimated to cover less than two per cent of the Queen Elizabeth Islands. However, they are of much more importance than their total area would indicate because these isolated rich sites provide most of the primary productivity for the rest of the food web on land (Babb and Bliss 1974b: 235–236). The larger of these important areas have been mapped by Babb and Bliss (*op. cit.*) but many of

them are too small to map, and, in addition, some criticism of the maps themselves has recently been made (Barnett *et al.* 1975: 75). Even very small meadows, of the kind that has been studied in detail on the Truelove Lowland on Devon Island, can be of great local importance from a productivity point of view. As an example, the northwestern coastal region of Cornwallis Island supports a small area of pond-covered lowland that is almost completely covered with grasses. This area, only about 15 square miles in area, is too small to show on most maps. Yet it has been described as an oasis in an otherwise Arctic desert, with recorded use by small groups of caribou and musk-oxen (Thorsteinsson 1958).

Other food habitats that vary significantly from the surrounding terrain are the floodplains and deltas of northern rivers which are areas of high productivity set within the less productive tundra landscape (Harding 1974: 5). Aside from the most conspicuous of these more highly productive areas, the Mackenzie Delta, more localized examples occur in the eastern Arctic. On Somerset Island, lowland meadow complexes occur at the mouths of four of the island's rivers. Wildlife is scarce on this island except near these larger river deltas. These same delta areas also serve as calving grounds for beluga whales (Babb and Bliss 1974b: 236).

Finally, it is important to note the large variation of primary productivity that can occur over very short distances in tundra habitats. Between nearly bare polygon centres and fully plant-covered polygon margins, between turf banks and alternating steps of bare soil, or between hummocks and hollows – all involving a distance of one meter or less – productivity and standing crop can vary by as much as 100-fold (Beschel 1970: 86). Even greater variation occurs between the vegetation on soil and the vegetation on rock, with the lichen growth on rock being barely measurable. In the study areas on Truelove Lowland, total production by plants, excluding mosses and lichens, was 130 to 155 grams per square meter per year in the more lush meadows, but only 65 to 85 grams per square meter per year in the drier habitats (Bliss and Kerik 1973: 35). The above-ground production (excluding roots) in this same area was about 29 grams per square meter per year in sedge meadows disturbed by frost boils but around 45 per square meter per year in hummocky and wet sedge meadows (Muc 1973: 5).

VARIABILITY OF SECONDARY PRODUCTIVITY BY ANIMALS

The 1972 Mont Gabriel conference on guidelines for scientific activities in northern Canada concluded that additional research on productivity was needed for walruses, ringed seals, beluga whales, char, waterfowl, and for caribou on Baffin Island (Greenaway 1973: Table 1). This list implies that the knowledge about productivity in most Arctic land animals is satisfactory. However, secondary productivity in land animals is not an easy subject in which to obtain data that can be compared from one study area to the next. As a result, it is doubtful that a map of regional differences in secondary productivity could be produced for Arctic Canada. The examples below focus more on densities (numbers of animals per unit area of land) and recorded examples of regional variations in densities of various species. One should not assume a direct relationship between these observed densities and the potential for secondary production in the place where the observations were made.

In the western Queen Elizabeth Islands musk-oxen are concentrated in coastal areas. Fifty-one per cent of 3,364 musk-oxen seen on Melville, Bathurst and Prince Patrick islands in March and April 1973 were within 2.5 kilometers of the coast, 75 per cent within 5.0 kilometers, and only eight per cent beyond 10 kilometers. The coastal zone extending inland 2.5 kilometers represents only 18 per cent of the total land area of Melville and Bathurst islands (Miller and Russell 1974: Table 3). In this example there appears to be a significant difference in the secondary production of musk-oxen in coastal areas as opposed to inland areas of these islands. Musk-oxen densities on northeast Devon Island have been given at 0.7 to 1.4 animals per square mile in a 1964 estimate (Harington 1964: 80), 3.1 animals per square mile in a 1971 report (Freeman 1971: 103), and 2.0 animals per square mile in 1972 (Hubert 1972: 274). Further west, the greatest density of musk-oxen observed in 1972 surveys was at Bailey Point on southwest Melville Island where 4.7 animals per square mile were recorded. The sheltered habitat of the Bailey Point area is thought to provide more favourable winter conditions and to enhance summer plant growth (Miller *et al.* 1973: 6).

Several scientists have noted the relationships between geological formations, plant growth, and musk-oxen or caribou abundance. The Beaufort Formation, occupying the northwestern fringes of the Arctic Islands from Banks Island to Meighen Island, is particularly sterile for plant life and decomposers (Savile 1961: 911). Not surprisingly, then, on Borden Island the 749 square miles of Beaufort Formation was noted to be unoccupied by caribou, with vegetation and caribou being confined to the 550 square miles of Paleozoic and early Tertiary geological formations on that island (Tener 1963: Table XII). The lack of vegetation on the limestone rocks of Devon Island is thought to limit the number of caribou that could be supported. In contrast, Bathurst Island had the greatest wildlife productivity of various islands surveyed in 1961 (Tener 1963: 15). Bathurst Island's relatively rich vegetation was attributed to the presence of sandstone and a long coastline that penetrates, as bays and peninsulas, into the island in many places.

Most biologists who have studied Barren Ground caribou have thought that the tundra ranges are more than adequate for present populations and that they would be adequate for greatly increased populations (Kelsall 1968: 293). Destruction of winter range by fire is one of several factors limiting Barren

Ground caribou populations (Scotter 1971: 210). In summer, caribou use the new growth of grasses, sedges and shrubs in preference to the slow-growing lichens that form their winter diet. Examination of heavily used summer ranges such as the Thelon River valley or the Bathurst Inlet coastal plain shows that the favoured food plants are thriving even at points of heaviest use by caribou (Kelsall 1968: 293). Some parts of the tundra are undoubtedly more productive than others. Some areas probably could not support large numbers of caribou for more than a few days per year. However, caribou range so widely that patches of poor range are of little consequence. Estimates of the standing crop of caribou and other ungulates have indicated that, in terms of weight of animals per unit area of land, there is as much as a 20-fold difference between the Canadian tundra and places such as the Nelchina Basin in Alaska. However, despite this 20-fold difference in standing crop of secondary producers in diverse parts of the north, their overall standing crop is very low compared to other parts of the world. For example, ungulates in the African savanna have a standing crop (weight of animals per unit area of land) that is about 1,000 times greater than the standing crop of ungulates on the Canadian tundra (Bliss *et al.* 1973: 372).

In summary, lowland habitats are of above-average importance for a large number of animals in summer. Waterfowl have their greatest productivity adjacent to lowland marshes, coastal lagoons or deltas (Barry 1967). The lowland habitat of western Banks Island provides ideal habitat for foxes and their prey (Usher 1970: 6). Lowland areas on Bathurst Island, such as Bracebridge–Goodsir valley, are of particular importance for musk-oxen in August, September and October (Gray 1973). Concentration of musk-oxen on other lowlands near the coasts of various Arctic islands was referred to earlier in this review.

In winter, various uplands assume a greater importance as a food base for secondary producers, largely because of snow-free conditions on the uplands.

Some Conclusions, Implications and Further Observations

General Conclusions about Arctic Biological Productivity

1. Many aspects of biological productivity have been studied in marine freshwater and land habitats in the Canadian Arctic but it is not possible to say that the relatively large number of published reports (Peterson 1974) give us a very complete picture of northern biological productivity.

2. On the basis of present information it is not possible to estimate how many people could obtain a livelihood directly from the land without exceeding its productive capacity (Naysmith 1971: 31). Biological studies have made it clear that the allocation of so many acres per person to support the harvest of renewable resources could not be based upon experience in the south because biological productivity in the Arctic is so much lower than it is in non-Arctic areas.

3. Potential harvest is not equivalent to total biological production. In the first place, man must share the production with other carnivores in the food chain. Secondly, man must leave a large enough fraction of the annual biological production to maintain the population that produced it.

4. An area of high biological productivity does not necessarily imply that it is an area of high harvest potential. An area's yield for hunting may be dependent upon other factors such as access, stones for building food caches, or some other factor unrelated to productivity itself. On this basis, the areas of most importance will be those that possess both high rates of biological productivity and other requirements for harvesting, use, or storage of the resource.

5. There is no long-term assurance that southern Canada will always have food available for shipment to less productive parts of the country. Local food production, based on the natural biological productivity of plants and animals, will increase in importance as human populations increase and as agricultural and industrial food production faces increased scarcity of its main raw material, fossil fuels (Pimental *et al.* 1973: 448).

Conclusions Relating to Marine Productivity

1. Marine productivities, considering all of the earth's oceans, cover the same wide range of productivities known on land. The two grams of organic matter formed per square meter per year beneath the Arctic ice cap compares with the exceptionally low productivity of arid deserts; the 3,000 grams per square meter per year in very productive coastal marine areas is comparable to the productivity of tropical rain forests (Whittaker 1970: 93).

2. The usual harvest from the ocean is fish, most species of which are carnivores of high positions in food chains. This is significant because man can harvest through these carnivores only a fraction – much below one per cent – of the primary production. Therefore, when the characteristically low primary production of Arctic waters is combined with the fact that very little of the energy (or protein) is available for man's harvest in any case, it is not surprising that there has been little or no commercial development of marine fishery resources in Arctic regions.

3. Productivity of northern marine waters is generally much greater than that on a comparable area of land. This is particularly so in the zone where Arctic and sub-Arctic waters meet. Mainly because of this higher marine productivity, relative to land productivity, hunting has evolved around marine mammals and especially the ringed seals.

4. The recent emphasis on dissolved organic matter as a factor in marine productivity (Pomeroy 1974; Wilce 1967) suggests that biological production in any given locality could be dependent upon relatively distant marine areas that serve as sources of dissolved organic matter.

Conclusions Relating to Freshwater Productivity

1. Northern freshwaters contain about 10 species of fish of a size and productivity to be important to man (McTaggart-Cowan 1973: 108). However, Arctic char is the most abundant fish of both island areas and coastal parts of the mainland (Hunter 1970; Johnson 1973: 219). Annual fish production in the several large Arctic lakes (Stanwell-Fletcher Lake, Hazen Lake and Nettilling Lake) averages about 0.3 pounds per acre of water surface, with good standing crops available for future production (Hunter 1971). This productivity rate, at something less than half a pound of fish per acre per year, is at least 10 times less than the productivity of more southern lakes (Sprague 1973: 171).
2. The most productive freshwater systems are areas such as the Mackenzie Delta and other smaller deltas where the higher primary and secondary production are combined with fish stocks that come in from the sea, bringing with them the productivity of large areas of ocean (Sprague 1973: 171).
3. Growth rate is slow in Arctic freshwaters and the biological time scale is lengthened compared to that in southern Canada. Instead of several generations of a particular plankton species in one year as found in the south, there may be only one generation in two years for the same species in the north (Sprague 1973: 171).
4. If a larger fish harvest is needed, there are fewer opportunities to increase the harvest in a northern lake than there would be in more productive lakes further south. One of the reasons is that Arctic lakes are very vulnerable to over-fishing due to the slow growth rate that occurs at low temperatures and the low nutrient levels in the stable water layers (Dunbar 1973a: 90). If more fish are needed, the only alternative to increased harvest from a given lake is to harvest from other lakes – to increase the radius of harvest. As with marine productivity, this also suggests that maintenance of the productivity base may require protection of some relatively distant freshwater areas.

Conclusions Relating to Land Productivity

1. As one moves northward, vegetation becomes more and more depressed, biological productivity of the land decreases and life is oriented toward water bodies and, in the extreme north, toward the sea. For example, the snow bunting in most of its range is a land bird. However, in the northern Arctic islands buntings rely more on a marine source of food, eating plankton which are washed by waves onto the top of the ice (Uspenskii 1970: 199).
2. Meadow areas of relatively high productivity cover less than two per cent of the Queen Elizabeth Islands but these habitats are of much more importance than their total area would indicate because they provide much of the primary productivity for the food web on the land (Babb and Bliss 1974b: 236).
3. Because of the generally low biological productivity of northern lands, the scattered distribution of islands of higher productivity, and the great distances that sometimes separate the summer and winter habitats of large herbivores such as the Barren Ground caribou, it is necessary to consider larger land areas to safeguard the total productivity base than would be required in the south.
4. Quite apart from the natural variations in productive capacity of the land and its vegetation, there can be variations in physical features of the landscape that have an important influence on whether wildlife resources are abundant or available for harvest in a given area. An example of this is provided by eskers that serve as caribou migration routes in the eastern Arctic mainland (Pruitt 1970: 20). Even though these eskers are not, themselves, a very productive landform they serve a vital role in maintaining the productivity base of the major herbivore in the food web.
5. The low primary productivity of tundra plant communities results in the requirement for relatively large land areas to support herbivores and carnivores. There are also suggestions, based on ecological theory, that recovery from the extreme population lows that characterize some tundra animals can be accomplished only in ecosystems that have a large geographic scale (Dunbar 1973b: 180), which is the case in the Arctic. This suggests that even though there is not continuous "use" of all of the large range occupied by migratory animals or all of the large area frequented by hunters, the large geographic scale is, itself, an important feature that helps to maintain the secondary producers in Arctic ecosystems.
6. Distinct habitat types seldom cover large areas in the tundra. As an adaptation to this, caribou feed over all tundra habitat types. They do, however, show seasonal preferences. The dry upland sites are important in winter because there is less snow there; the lush areas of vegetation in lowlands are important in spring at the end of migration (Kelsall 1968: 87). Carrying capacities of various caribou ranges have been estimated at one animal per square mile for the Mackenzie Delta Reindeer Reserve, but only one animal per 100 square miles in the Arctic islands (Clarke 1973: 207).
7. For many species of wildlife, survival and continuing productivity are absolutely dependent upon the maintenance

of certain critical parts of the environment. Examples would be caribou calving grounds, concentration points on migration routes, nesting and staging areas for geese, polar bear denning grounds, and sea bird nesting colonies (McTaggart-Cowan 1973: 109).

References

Apollonio, S.
1965 Chlorophyll in Arctic sea ice. *Arctic,* 18: 118–122.
1971 The Arctic: deep freeze fountain of life. *Oceans,* 4: 38–41.

Babb, T. A. and L. C. Bliss
1974a Effects of physical disturbance on Arctic vegetation in the Queen Elizabeth Islands. *Journal of Applied Ecology,* 11: 549–562.
1974b Susceptibility to environmental impact in the Queen Elizabeth Islands. *Arctic,* 27: 234–237.

Bannikov, A. G.
1970 Arctic fox in the U.S.S.R.: Biological premises of productivity. Pp. 121–130. In W. A. Fuller and P. G. Kevan (editors), *Productivity and conservation in northern circumpolar lands.* I.U.C.N. Publications New Series, no. 16. Morges, Switzerland.

Barnett, D. M., S. A. Edlund and D. A. Hodgson
1975 Sensitivity of surface materials and vegetation to disturbance in the Queen Elizabeth Islands: an approach and commentary. *Arctic,* 28: 74–76.

Barry, T. W.
1967 *Geese of the Anderson River delta, N.W.T.* University of Alberta (Ph.D. thesis). Pp. 212.

Beschel, R. E.
1970 The diversity of tundra vegetation. Pp. 85–92. In W. A. Fuller and P. G. Kevan (editors), *Productivity and conservation in northern circumpolar lands.* I.U.C.N. Publications New Series, no. 16. Morges, Switzerland.

Bissett, D.
1967 *Northern Baffin Island: An area economic survey.* Volume 2 of the Northern Baffin Island report. Department of Indian Affairs and Northern Development, Ottawa. A.E.S.R. 67/1. Pp. 131.

Bliss, L. C.
1970 Primary production within Arctic tundra ecosystems. Pp. 77–85. In W. A. Fuller and P. G. Kevan (editors), *Productivity and conservation in northern circumpolar lands.* I.U.C.N. Publications New Series, no. 16. Morges, Switzerland.

Bliss, L. C., G. M. Courtin, D. L. Pattie, R. R. Riewe, D. W. A. Whitfield and P. Widden
1973 Arctic tundra ecosystems. *Annual Review of Ecology and Systematics,* 4: 359–399.

Bliss, L. C. and J. Kerik
1973 Primary production of plant communities of the Truelove Lowland, Devon Island, Canada – Rock outcrops. Pp. 27–36. In L. C. Bliss and F. E. Wielgolaski (editors), *Primary production and production processes, tundra biome.* Dublin, Ireland, International Biological Program.

Brunskill, G. J., D. M. Rosenberg, N. B. Snow, G. L. Vascotto and R. Wagemann
1973 *Ecological studies of aquatic systems in the Mackenzie-Porcupine drainages in relation to proposed pipeline and highway developments.* Volume I. Environmental-Social Committee, Northern Pipelines, Task Force on Northern Oil Development, Report 73–74. Pp. 131.

Canada
1973 *Fisheries Research Board of Canada*, Review. Arctic Biological Station, Ste. Anne de Bellevue. Pp. 85–95.

Clarke, C. H. D.
1973 Terrestrial wildlife and northern development. Pp. 195–234. In D. H. Pimlott, K. M. Vincent, and C. E. McKnight (editors), *Arctic Alternatives.* Canadian Arctic Resources Committee, Ottawa.

Dunbar, M. J.
1957 The determinants of production in northern seas: A study of the biology of *Themisto libellula* Mandt. *Canadian Journal of Zoology*, 35: 797–819.
1970a On the fishery potential of the sea waters of the Canadian North. *Arctic*, 23: 150–174.
1970b The scientific importance of the circumpolar region, and its flora and fauna. Pp. 71–77. In W. A. Fuller and P. G. Kevan (editors), *Productivity and conservation in northern circumpolar lands.* I.U.C.N. Publications New Series, no. 16. Morges, Switzerland.
1973a Renewable resources. Pp. 85–98. In K. R. Greenaway (editor), *Science and the north. A seminar on guidelines for scientific activities in northern Canada 1972*. Information Canada, Ottawa.
1973b Stability and fragility in arctic ecosystems. *Arctic*, 26: 179–185.

Freeman, M. M. R.
1969/70 Studies in maritime hunting I. Ecologic and technologic restraints on walrus hunting, Southampton Island, N.W.T. *Folk*, 11–12: 155–171.
1970 Productivity studies on high arctic musk-oxen. *Arctic Circular*, 20(3): 58–65.
1971 Population characteristics of musk-oxen in the Jones Sound Region of the Northwest Territories. *Journal of Wildlife Management*, 35: 103–108.

Frey, D. G. and J. B. Stahl
1958 Measurements of primary production on Southampton Island in the Canadian Arctic. *Limnology and Oceanography*, 3: 215–221.

Gill, D.
1973 Floristics of a plant succession sequence in the Mackenzie Delta. *Polarforschung*, 43: 55–65.
1974 Influence of waterfowl on the distribution of Beckmannia syzigachne in the Mackenzie River Delta, Northwest Territories. *Journal of Biogeography*, 1: 63–69.

Grainger, E. H.
1959 The annual oceanographic cycle at Igloolik in the Canadian Arctic. I. The zooplankton and physical and chemical observations. *Journal of the Fisheries Research Board of Canada*, 16: 453–501.
1962 Zooplankton of Foxe Basin in the Canadian Arctic. *Journal of the Fisheries Research Board of Canada*, 19: 377–400

Gray, D. R.
1973 *Social organization and behaviour of muskoxen (Ovibos moschatus) on Bathurst Island, N.W.T.* University of Alberta (Ph. D. thesis). Pp. 212.

Greenaway, K. R. (editor)
1973 Renewable resources. Pp. 20–21. In *Science and the north. A seminar on guidelines for scientific activities in northern Canada 1972*. Information Canada, Ottawa.

Haag, R. W.
1974 Nutrient limitation to plant production in two tundra communities. *Canadian Journal of Botany*, 52: 103–116.

Harding, L.
1974 Mackenzie Delta: home of abounding life. *Canadian Geographical Journal*, 88: 4–13.

Harington, C. R.
1964 Remarks on Devon Island muskoxen. *Canadian Journal of Zoology*, 42: 79–86.
1968 Denning habits of the polar bear *(Ursus maritimus* Phipps). *Canadian Wildlife Service, Report Series 5.* Ottawa. Pp. 30.

Holloway, C. W.
1970 Threatened vertebrates in northern circumpolar regions. Pp. 175–192. In W. A. Fuller and P. G. Kevan (editors), *Productivity and conservation in northern circumpolar lands.* I.U.C.N. Publications New Series, no. 16, Morges, Switzerland.

Hubert, B.
1972 Productivity of muskox. Pp. 272–280. In L. C. Bliss (editor), *Devon Island I.B.P. Project, High Arctic Ecosystem, Project Report 1970 and 1971*. Department of Botany, University of Alberta.

Hunter, J. G.
1966 The Arctic char. *Fisheries of Canada,* 19: 17–9.
1970 *Production of Arctic char (Salvelinus alpinus Linnaeus) in a small Arctic lake*. Fisheries Research Board of Canada. Technical Report, no. 231. Pp. 190.
1971 Fisheries Research Board studies in Canada's Arctic. *Canadian Geographical Journal*, 82: 100–107.

Hynes, H. B. N.
1970 *The ecology of running waters*. University of Toronto Press, Toronto. Pp. 555.
Hynes, H. B. N., N. K. Kaushik, M. A. Lock, D. L. Lush, Z. S. J. Stocker, R. R. Wallace and D. D. Williams
1974 Benthos and allochthonous organic matter in streams. *Journal of the Fisheries Research Board of Canada*, 31: 545–553.

Johnson, L.
1973 Stock and recruitment in some unexploited Canadian Arctic lakes. *Conseil International pour l'Exploration de la Mer. Extrait des Rapports et Procès-Verbaux,* 164: 219–227.

Kalff, J. and H. E. Welch
1974 Phytoplankton production in Char Lake, a natural polar lake, and in Meretta Lake, a polluted polar lake, Cornwallis Island, Northwest Territories. *Journal of the Fisheries Research Board of Canada*, 31: 621–636.

Kelsall, J. P.
1968 The migratory barren-ground caribou of Canada. *Canadian Wildlife Service, Monograph,* no. 3. Ottawa. Pp. 340.

Lasenby, D.
1971 *Ecology of Mysis relicta in an Arctic and a temperate lake*. University of Toronto (Ph.D. thesis). Pp. 92.

Loughrey, A. G.
1955 Preliminary investigation of the Atlantic walrus, *Odobenus rosmarus rosmarus* (Linnaeus). *Canadian Wildlife Service, Wildlife Management Bulletin*, Series 1, no. 12. Ottawa. Pp. 123.

Mann, K. H.
1973 Seaweeds: Their productivity and strategy for growth. *Science*, 182: 975–981.

Macpherson, A. H.
1970 Situation report on Canadian Arctic fox research. Pp. 130–132. In W. A. Fuller and P. G. Kevan (editors), *Productivity and conservation in northern circumpolar lands*. I.U.C.N. Publications New Series, no. 16. Morges, Switzerland.

McLaren, I. A.
1961 Methods of determining the numbers and availability of ringed seals in the eastern Canadian Arctic. *Arctic,* 14: 162–175.
1962 Population dynamics and exploitation of seals in the eastern Canadian Arctic. Pp. 168–183. In E. D. LeCren and M. H. Holdgate (editors), *The exploitation of natural animal populations*. Blackwell Publications, Oxford.

McKay, G. A.
1970 Climate: A critical factor in the tundra. Pp. 43–50. In *The Tundra Environment,* The Royal Society of Canada, University of Toronto Press.

McTaggart-Cowan, I.
1973 An "overview" with particular reference to fish and wildlife. Pp. 108–110. In K. R. Greenaway (editor), *Science and the north. A seminar on guidelines for scientific activities in northern Canada 1972*. Information Canada, Ottawa.

Meguro, H., K. Ito and H. Fikushima
1967 Ice flora (bottom type): a mechanism of primary production in polar seas and the growth of diatoms in sea ice. *Arctic*, 20: 114–133.

Miller, F. L., R. H. Russell and D. R. Urquhart
1973 Preliminary surveys of Peary caribou and muskoxen on Melville, Eglinton and Byam Martin Islands, Northwest Territories, 1972. *Canadian Wildlife Service, Progress Notes,* no. 33. Ottawa. Pp. 9.

Miller, F. L. and R. H. Russell
1974 Distribution and numbers of muskoxen *(Ovibos moschatus)* on western Queen Elizabeth Islands of Arctic Canada. *Journal of Mammalogy*, 55: 824–828.

Mohr, J. L. and J. L. Tibbs
1963 Ecology of ice substrates. Pp. 245–252. In *Proceedings of the Arctic Basin Symposium,* Arctic Institute of North America, Washington, D.C.

Moore, J. W.
1974 The benthic algae of southern Baffin Island, I. Epipelic communities in rivers. *Journal of Phycology*, 10: 50–57.

Muc, M.
1973 Primary production in plant communities of the Truelove Lowland, Devon Island, Canada — sedge meadows. Pp. 3–14. In L. C. Bliss and F. E. Wielgolaski (editors), *Primary production and production processes, tundra biome*. Dublin, Ireland, International Biological Program.

Naysmith, J. K.
1971 *Canada north – man and the land*. Department of Indian Affairs and Northern Development, Ottawa. Pp. 44.

Nettleship, D. N.
1973 Canadian sea bird research. *Marine Pollution Bulletin,* 4: 62–64.

Pakarinen, P. and D. H. Vitt
1973 Primary production of plant communities of the Truelove Lowland, Devon Island, Canada – Moss communities. Pp. 37–46. In L. C. Bliss and F. E. Wielgolaski (editors), *Primary production and production processes, tundra biome*. Dublin, Ireland, International Biological Program.

Peterson, N. M.
1974 *Ecology of the Canadian Arctic Archipelago: Selected references*. Department of Indian and Northern Affairs, Ottawa. Publication no. QS-1572-010-EE-A1. Pp. 846.

Pimentel, D., L. E. Hurd, A. C. Bellotti, M. J. Forster, I. N. Oka, O. D. Sholes and R. J. Whitman
1973 Food production and the energy crisis. *Science,* 182: 443–448.

Pomeroy, L. R.
1974 The ocean's food web, a changing paradigm. *Bioscience,* 24: 499–504.

Pruitt, W. O. Jr.
1970 Tundra animals: What is their future? *Transactions of the Royal Society of Canada,* 8: 373–385.

Rigler, F. H.
1972 The Char Lake project. A study of energy flow in a High Arctic lake. Pp. 287–300. In Z. Kajak and A. Hillbricht-Ilkowska (editors), *Productivity problems of freshwaters*. Proceedings of the IBP-UNESCO Symposium on Productivity Problems of Freshwaters, 6–12 May 1970. Kazimierz Dolny, Poland.

Rigler, F. H., M. C. MacCallum and J. C. Roff
1974 Production of zooplankton in Char Lake. *Journal of the Fisheries Research Board of Canada,* 31: 637–646.

Ross, W. G.
1974 Distribution, migration, and depletion of bowhead whales in Hudson Bay, 1860 to 1915. *Arctic and Alpine Research,* 6: 85–98.

Ryther, J. H.
1969 Photosynthesis and fish production in the sea. *Science,* 166: 72–76.

Savile, D. B. O.
1961 The botany of the northwestern Queen Elizabeth Islands. *Canadian Journal of Botany,* 39: 909–942.
1972 Arctic adaptations in plants. *Department of Agriculture, Monograph,* no. 6. Ottawa. Pp. 81.

Schindler, D. W., J. Kalff, H. E. Welch, G. J. Brunskill, H. Kling and N. Kritsch
1974 Eutrophication in the High Arctic – Meretta Lake, Cornwallis Island (75° N Lat.). *Journal of the Fisheries Research Board of Canada,* 31: 647–662.

Schultz, A. M.
1964 The nutrient-recovery hypothesis for Arctic microtine cycles, II. Ecosystem variables in relation to Arctic microtine cycles. Pp. 57–67. In D. J. Crisp (editor), *Grazing in terrestrial and marine environments*. Blackwell Publications, Oxford.

Scotter, G. W.
1971 Fire, vegetation, soil and barren ground caribou relations in northern Canada. Pp. 209–226. In C. W. Slaughter, R. J. Barney and G. M. Hansen (editors), *Fire in the northern Environment – a symposium*. Forest Service, U.S. Department of Agriculture, Portland, Oregon.

Sergeant, D. E. and P. F. Brodie
1969 Body size in white whales, *Delphinapterus leucas*. *Journal of the Fisheries Research Board of Canada,* 26: 2561–2580.

Skrobov, V. D. and E. A. Shirokovskaya
1967 The role of the Arctic fox in improving the vegetation cover of the tundra. *Problems of the North,* 11: 123–128. (Translated from Russian by N.R.C., Canada.)

Smith, T. G.
1973a *Censusing and estimating the size of ringed seal populations*. Fisheries Research Board of Canada, Arctic Biological Station, Ste. Anne de Bellevue, Quebec. Technical Report 427. Pp. 18.
1973b Management research on the Eskimo's ringed seals. *Canadian Geographical Journal,* 84: 118–125.

Sprague, J. B.
1973 Aquatic resources in the Canadian North: Knowledge, dangers and research needs. Pp. 169–189. In D. H. Pimlott, K. M. Vincent and C. E. McKnight (editors), *Arctic Alternatives.* Canadian Arctic Resources Committee, Ottawa.

Steinhart, J. S. and C. E. Steinhart
1974 Energy use in U.S. food systems. *Science,* 184: 307–316.

Stocker, Z. S. J.
1973 *The ecology of streams at Char Lake, Resolute Bay, Northwest Territories.* University of Waterloo (M. Sc. thesis). Pp. 122

Tener, J. S.
1963 Queen Elizabeth Islands game survey, 1961. *Canadian Wildlife Service,* Occasional Paper, no. 4. Ottawa. Pp. 50.
1965 Musk-oxen in Canada. A biological and taxonomic review. *Canadian Wildlife Service,* Monograph 2. Ottawa. Pp. 166.

Thorsteinsson, R.
1958 Cornwallis and Little Cornwallis Islands, District of Franklin, Northwest Territories. *Geological Survey of Canada,* Memoir 294. Ottawa.

Tikhomirov, B. A.
1959 *Relationship of the animal world and the plant cover of the tundra.* Botanical Institute, Academy of Science of the U.S.S.R., Moscow. (Translated by E. Issakoff and T. W. Barry, edited by W. A. Fuller.) Pp. 87.

Tuck, L. M.
1960 The murres – their distribution, populations and biology – a study of the genus *Uria. Canadian Wildlife Service, Canadian Wildlife Series,* 1. Ottawa. Pp. 260.

Usher, P. J.
1970 *The Bankslanders: Economy and ecology of a frontier trapping community. Volume 2 – Economy and ecology.* Department of Indian Affairs and Northern Development, N.S.R.G.: 71–2. Pp. 169.

Uspenskii, S. M.
1970 Problems and forms of fauna conservation in the Soviet Arctic and Subarctic. Pp. 199–207. In W. A. Fuller and P. G. Kevan (editors), *Productivity and conservation in northern circumpolar lands.* I.U.C.N. Publications New Series, no. 16. Morges, Switzerland.

Vibe, C.
1967 Arctic animals in relation to climatic fluctuations. *Meddelelser om Gronland,* 170 (5): 1–227.

Warren Wilson, J.
1957 Arctic plant growth. *Advancement of Science,* 13: 383–388.

Welch, H. E.
1974 Metabolic rates of Arctic lakes. *Limnology and Oceanography,* 19: 65–73.

Welch, H. E. and J. Kalff
1974 Benthic photosynthesis and respiration in Char Lake. *Journal of the Fisheries Research Board of Canada,* 31: 609–620.

Whittaker, R. H.
1970 *Communities and ecosystems.* Macmillan Company, London. Pp. 162.

Wilce, R. T.
1967 Heterotrophy in Arctic sublittoral seaweeds: An hypothesis. *Botanica Marina,* X: 185–197.

Part II:

The Prehistoric and Historic Evidence

Introduction

One of the primary objectives of this study has been to illustrate the extent – in time as well as space – of Inuit use and occupation of their land.

The project's fieldwork concentrated primarily on contemporary land use and occupancy. To demonstrate the extent of past land use we have obtained the assistance of qualified consultants or have reprinted reports published elsewhere which deal with these issues.

In March 1974 an Arctic Prehistory Workshop was held to compile a series of maps illustrating Inuit prehistoric occupation of the northern regions of Canada. Culturally, modern Inuit are partly a product of contact with European-derived cultures over the past two hundred years. However, as William Taylor writes, there is little doubt, both biologically and culturally, that Inuit of today are the descendants of the Thule population who, for a thousand years occupied a vast expanse of the Arctic. Indeed, from our mapping of Thule culture presumptive land use, it appears these people occupied a slightly greater extent of land than have their modern day descendents, caused in part by the retreat of Inuit from the High Arctic islands in the 17th and 18th centuries at the time of worsening climatic conditions.

To what extent can present day Inuit inhabitants of the Arctic be said to have an even longer period of ancestry in the north, than the 1,000 years unquestionably established by radio-carbon dating of Thule remains?

The areas of geographical overlap between Thule culture occupation and the preceding Dorset culture occupation do not show any temporal hiatus between successive cultural occupations. Indeed, in some areas it appears the two populations might have, for a short period at least, existed together, though Inuit oral tradition has it that their ancestors soon displaced the smaller, yet strong, Dorset people using the same land areas.

That Dorset culture people are distinguishable from the later Thule people is not surprising though. Indeed, contemporary and historic variants of the basic Inuit culture are well known, and it is highly unlikely that any human culture remains typologically and ecologically unchanging century after century, especially where, as in the Arctic, profound climatic and other environmental changes take place. Inuit-type culture traits are unmistakable in the case of the Dorset people, and Taylor, a recognized authority on Dorset culture relationships, writing a decade ago, concludes that for the Dorset, the general picture is of a variant of Eskimo culture, complete with such familiar items as toggling harpoons for hunting seals, whales and walruses, and soapstone lamps to burn the fats. After a further decade of archeological research, McGhee summarizes the newer evidence which continues to support Taylor's earlier conclusions. Whereas when Taylor wrote, hardly any skeletal remains had been found that dated from Dorset times, a large amount of material has since been found dating from the Dorset occupation of Newfoundland. In McGhee's view the skeletal material available at present is sufficient to prove the characteristically Eskimo physical type of the Dorset people.

Thus the Dorset culture (really cultures, as several regional variants are recognized) extends Eskimo occupation of the Arctic back a further 2,000 years, though the earliest dates (ca. 1000 B.C.) occur in Greenland. For the Canadian Arctic, the earliest dates of occupation appear around 500 B.C. As McGhee points out, the period from 500 B.C. back to the earliest appearance of Dorset allows sufficient time to account for the variation which separates (typologically) the Dorset culture from the even older Pre-Dorset cultures that preceeded them.

The Pre-Dorset paleo-Eskimo cultures are poorly known to archeologists over much of their range due to their antiquity. However, the extent of Pre-Dorset occupation was considerably greater than more recent occupations, and doubtless suffered an areal decline around 2000 B.C. as a result of climatic deterioration in the Arctic at that time.

For our purposes then, the prehistoric Eskimo occupation of the Arctic regions of Canada extends back about 4,000 years, and ended when contact with European-derived cultures in the 18th and 19th centuries helped transform the Thule culture populations of the Canadian Arctic to the Inuit of historic times and today.

The period immediately following this contact, namely the 19th century, is reviewed in the paper by Ross. The conclusion shows that no hiatus in occupation appears between the end of the prehistoric period and the early historic period. Although local population movements, and even local extinctions, may have occurred as a result of these historic contacts, the Inuit population has remained highly mobile and has continued its unbroken and exclusive occupation of the Arctic since time immemorial. The times of which Ross writes heralded great changes in the north, changes that were rendered irrevocable when the presence of whalers, explorers, and other transient Whites was replaced by the more permanent presence of the fur traders in the early years of this present century.

The paper by Usher covers this important phase of northern history. The network of Arctic fur trade posts can be taken as a reflection of the spatial distribution of the Inuit during this period of the recent past. Though the traders were primarily interested in Inuit exploitation of fine furs in the Mackenzie Delta and the tundra regions, it is important to remember that such trapping was supported by a full range of land use activities, for dogs had to be fed through a trapper's hunting and fishing endeavours, and similarly a trapper's family obtained clothing, food and fuel needs from traditional land use pursuits.

Usher's paper is also useful in serving as a link between the history and prehistory reports in this Volume and the land use reports appearing in Volume One. However, it also adds

to the material assembled in Volume One where certain areas of occupation (e.g. southwest Keewatin) have not been adequately reported due to the small population still surviving, or to the fact that the population may have withdrawn to Inuit areas outside of the Northwest Territories (as in the case of Mansel Island).

The prehistoric and historic period overviews presented in this report will not do sufficient justice to each region of the north, for which detailed prehistories and histories either have been written or doubtless could be written. As previously mentioned in this report, the scale of the research task required a sampling of certain material for presentation. By way of example, a single such regional history is included: in this case, the early history of the Inuit occupying the Mackenzie Delta and adjacent areas – a group who were formerly numerous, but suffered a decline in numbers following contact – whose descendants and successors have come to fully occupy the same regions as were used and occupied before the time of contact.

This section of the report should serve to establish two important conclusions concerning Inuit occupation of the Canadian Arctic regions. First, that the area occupied and used in historic times is not appreciably larger, or smaller, than that used in prehistoric times. Secondly, that the Inuit occupation of the north has been, to all intents and purposes, continuous for a period of around 4,000 years and has constituted an exclusive occupation throughout all of that time. The only qualification relates to southernmost fringe areas where various Indian populations periodically advanced northward in response to climate-induced biotic changes at the forest-tundra margin.

The Fragments of Eskimo Prehistory*

by William E. Taylor, Jr.**

A reader of Arctic history and ethnology might conclude that the friendly Arctic was sometimes deadly. Yet, turning to archeology, the reader learns that man has survived in Arctic America for some 5,000 years and that the Eskimo's ancestors prevailed over a vast expanse from easternmost Siberia to the Strait of Belle Isle and to Denmark Strait between Greenland and Iceland.

Although many pieces are yet to be found for the complex jigsaw puzzle of Eskimo prehistory, archeologists can outline the general nature of the picture by fitting in place its available fragments. This reveals the 50 centuries of Canadian Eskimo prehistory readily dividing into four major periods or stages. First there was the Pre-Dorset stage of nomadic hunters who drifted across the deglaciated Canadian Arctic from Alaska. Archeologists, somewhat given to polysyllabic locutions, refer to the Alaskan parent of Canadian Pre-Dorset as the Cape Denbigh Flint Complex of the Arctic Small Tool tradition.

The Denbigh Flint Complex, best known from the Alaskan side of Bering Strait and from the Brooks Range of northern Alaska, contains a long list of chipped chert and obsidian tools such as microblades, end scrapers, side scrapers, knife blades, and the most delicately fashioned inset side blades and points for hafting in lances, spears, arrows, and harpoon heads. Denbigh Complex sites also include a high percentage of burins, a distinctive and specialized chipped stone tool used for slicing, and perforating such hard materials as bone, caribou antler, and walrus ivory. The Denbigh Complex people were seasonal nomads many of whom summered on the coast hunting seal, probably with the aid of boats; others lived in the interior where they stressed caribou hunting. Various kinds of evidence, including radiocarbon dating, paleo-climatology, and geology, suggest that the Denbigh Complex or something very closely akin to it, existed in northern and western Alaska at about 3000 B.C., and probably it persisted there from about 3500 B.C. to 2500 B.C. Although some Denbigh traits recall still earlier Indian cultures far to the south in the interior of North America, many more reflect a relationship, perhaps old and indirect, with recently discovered Paleolithic and Mesolithic cultures of the Far East and with the early "Neolithic" of Siberia. Because no human skeletons and of course no trace of the language of the Denbigh hunters have been found, one cannot readily conclude that they were Eskimos. They did, however, have an Eskimo way of life, that is, a distinctive culture and economy adapted to treeless country, and further some of their objects persist in slightly altered form in much later, clearly Eskimo, sites. As J. L. Giddings, the discoverer of Denbigh recently wrote, "regardless of how we designate them, these Denbigh people appear to be in a direct line of cultural continuity with Eskimos". Also, interesting studies in the relatively new and exciting field of lexico-statistical dating suggest the Eskimo and Aleutian languages may, as a unified language family, be at least 5,000 years old.

Faced with the many, sometimes startling, developments in Eskimo archeology over the past 10 years, Arctic prehistorians are sometimes struck mute by caution or made unintelligible to the reader because of confusion and indecision. Nevertheless, it seems likely that the earliest "proto-Eskimo" of northern America derived their culture from Siberia and originally migrated from there. Perhaps the ancestors of Denbigh people drifted eastward along the southern edge of the former Bering Straits land bridge from what is now the southeastern coast of Siberia. If that were the case, the camps of those wanderers, now over 8,000 years old, are long since submerged under the cold waters of the Bering Sea.

Whatever the origin of Denbigh people, they and their descendants were well equipped to survive in the tundra world. The success of their Arctic adaptation appears clearly in the archeological record of their migrations for the descendants, harvesting the game on which their lives depended, spread eastward across northern Alaska, the central Canadian Arctic and the eastern Arctic islands to Greenland. Eventually they reached at least as far as northeastern and southwestern Greenland, Ungava peninsula in northern Quebec, and down through the Barren Lands and the west coast of Hudson Bay to Churchill, Manitoba. Carbon 14 dating suggests they reached northeastern Greenland by 2000 B.C. In the Canadian Arctic, this eastern development from the Denbigh threshold is called Pre-Dorset culture and it persisted over a large area until about 800 B.C. In southwestern Greenland Danish archeologists have found a late variant of Pre-Dorset called Sarqaq, which lasted there until about 500 B.C.

When lumping Denbigh, Pre-Dorset, Sarqaq and a few other regional variants all together, archeologists call the lump the Arctic Small Tool tradition for it is spread all across the tundra top of the continent, is characterized throughout by very small, carefully and delicately chipped stone tools, and lasted perhaps for 3,000 years. With comforting consistency these sites produce the burins, microblades, scrapers, knife and weapon points, and side blades by which the prehistorian recognizes the tradition. Some of the Canadian sites include the small subrectangular depressions left by the semi-subterranean winter houses of Pre-Dorset people, or the ring of boulders that secured the basis of their skin tents in summer camps. Occasionally charred and split stone cobbles mark the old hearths where they burnt greasy bones and scrub vegetation. The nature and the location of Pre-Dorset sites indicate that these people lived in small, widely scattered, nomadic bands, moving seasonally to exploit various game resources. They used toggling harpoons, spears, lances, and bows and arrows in hunting caribou and seals. Very likely fish and

*Excerpt of an article with the same name first published in 1965 in *The Beaver*, Hudson's Bay Company, Winnipeg.

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summer birds appeared on their menu and probably wide-eyed children heard yarns of encounters with bears, wolves, musk-oxen and walruses.

The second period in Canadian Eskimo prehistory is that of the Dorset culture. It derives its name from Cape Dorset on Baffin Island for it was from the H.B.C. post that the first recognized collection of Dorset period material was sent to Ottawa. Collected by Eskimos, it was received some 40 years ago by Diamond Jenness in the National Museum of Canada. Although Eskimo archeology had barely begun and despite the fact that the collection was completely mixed up, Jenness, in a brilliant feat of archeological detective work, managed to isolate the diagnostic specimens and to prepare the original definition of the culture (Jenness 1925). The abundant work of the past 40 years has confirmed and amplified Jenness's then revolutionary interpretations.

Like many others so long silent, the Dorset people had scant effect on the clattering, embattled course of man's history. Nevertheless they occupied a large part of the earth's surface and did so for an impressive number of centuries. The Dorset culture existed approximately from 800 B.C. to A.D. 1300 and spread from Bernard Harbour and Melville Island in the west to eastern Greenland and the northwest part of insular Newfoundland. In fact, the Newfoundland sites are some 2,400 miles and 2,300 miles respectively from those in northeast Greenland and those at Bernard Harbour in the Canadian Western Arctic – roughly the same as the mileage from Montreal to Los Angeles or Winnipeg to Tegucigalpa in Honduras. Within the Dorset area, sites seem most abundant in the Hudson Strait–Foxe Basin region. Although Dorset material occurs down the east side of Hudson Bay to the Belcher Islands, it has not been found on the Bay's west coast; nor does it seem to occur in the Barren Lands interior west of the Bay. So far the only inland find of Dorset sites have been at Payne Lake near the centre of Ungava peninsula.

The origin of Dorset culture has long been a question of hot scholarly debate despite the cold silence of the subject matter. Before the Pre-Dorset period was discovered scarcely a dozen years ago, some archeologists claimed Dorset derived by migration from Alaska while others argued it was basically an Indian way of life that was carried from the Great Lakes–St. Lawrence Valley area. A volley of recent reports on very early Dorset sites and on Pre-Dorset sites along with new results of radiocarbon dating has led to general agreement that Dorset culture developed first within the Canadian eastern Arctic from the Pre-Dorset culture, for many culture traits are shared by the two and other Dorset tool types are clearly evolved from Pre-Dorset prototypes. Further the Pre-Dorset and Dorset peoples lived very similar kinds of lives with the same adaptation, economy and settlement patterns. Nevertheless a few Dorset traits, lacking Pre-Dorset antecedents, may have been acquired by cultural diffusion from the western sub-Arctic and from early Indian groups in south-eastern Canada. The National Museum of Canada's 1963 Arctic field survey re-opens the possibility that the change from Pre-Dorset to Dorset involved the spread of some ideas eastward from Alaska because that survey extended the known range of Dorset occupations some 450 miles westward to Bernard Harbour where a rather early Dorset culture site was examined.

Like their predecessors, Dorset people lived in small seasonally-nomadic bands with little camps of skin tents in summer, sheltering in winter in small clusters of partly-underground pit houses. Some of these winter houses seem to have had skin roofs. Dorset man may have used, indeed might have invented, the snow-house. They hunted seals, bearded seals, walruses, and caribou; they fished extensively using stone traps and barbed spears; spears were also used in bird hunting. Heavy spears, lances, and toggling harpoons were used against the larger animals. Since there is very little evidence of domesticated dogs in this culture, Dorset people may have man-hauled their small ivory-shod sleds. Although they seem to have had skin boats, nothing is known precisely of the boat type. The Saga of Eirik the Red mentions Skraeling skin boats or canoes propelled by staves or paddles. In the northern part of Newfoundland island where the observation was likely made such might well be a reference to Dorset culture kayaks. Needle cases and an abundance of delicate bird bone needles suggest that Dorset people wore tailored fur clothing. They had, albeit a smaller model, that traditional Eskimo hallmark, the blubber-burning lamp, carved from soapstone, which provided heat for the dwelling, light, a means of drying clothing and an answer to their humble cooking needs. Implements made of antler, ivory, bone, or driftwood were tipped or edged with chipped and sometimes polished stone blades of chert, quartz, or quartzite. Such implements generally reflect a Pre-Dorset heritage but another category, blades of ground and polished slate, seem to have no adequate Pre-Dorset precursors, and thus may reflect Alaskan influences or may have been learnt from Indians to the south, some of whom used that technique.

The most excitement in excavating a Dorset site comes when someone unearths one of the small delicate carvings in ivory, antler, or bone, that characterizes Dorset art. These rare pieces, shaped with consummate skill with stone tools, range from about four inches to as little as three-eighths of an inch, and sometimes weigh only a small fraction of an ounce. Such figurines, often precisely realistic, sometimes of sophisticated abstraction, usually depict animals, birds, fish, humans, or mythical beasts. Sometimes a complete specimen represents only a part such as a walrus head, a caribou hoof, a human face or a gull's head. A second category of art is ornamentation, commonly of short lines, confidently set on various objects, often as a skeletal motif on the figurines.

The recent and very distinctive art of the Angmagssalik Eskimo of the east coast of Greenland shows a number of

traits similar to those found on Dorset culture carvings and this leads to the speculation that Angmagssalik art may have perpetuated some Dorset period art styles. If that were so one might wonder whether or not Angmagssalik culture was in some part derived from Dorset culture, whether perhaps it was a blend of Dorset and later cultures.

Until a few years ago nothing was known of Dorset people's burial practices or skeletons. Recently archeologists have discovered stone vault graves, stone-lined pit graves, and small gravel mound graves containing grave goods and red ochre. The skeletal remains have been very poorly preserved but what little there is suggests that the Dorset people were physically typical Eskimos. The much-debated work of linguistics leads me to think that the Dorset population spoke some old variant of the Eskimo language. Thus we may conclude for the Dorset period that the general picture is of Eskimo culture, and although not all the usual Eskimo traits are present, the picture does not fall from its frame.

Around A.D. 900 Dorset culture began to be crowded off the Arctic stage as the third major period of Canadian Eskimo prehistory pushed in from Alaska. Between about 900 and 1300 a vast thin drift of population spread over Arctic Canada and coastal Greenland almost completely burying the Dorset. Although there is some evidence of contact and mutual influence between the older Dorset and the emigrating Alaskans, the overall view is of nearly complete replacement. This third period, the Thule culture, persisted until about A.D. 1750. Thule evolved directly out of Birnirk culture of the north Alaskan coast and Birnirk, in turn, was a product of a long evolutionary trend of Eskimo culture stages in the Bering Strait region. Although some part of that evolutionary lineage extends back to the old Denbigh Flint Complex of 3000 B.C., diffusion from Siberia and from northwestern North America along with local modifications and inventions must have played a significant part in that still little-known progression.

This seems the place to inject a necessary rebuttal to Tryggvi Oleson's surprising recent revival and extension of Duason's odd ideas on Eskimo prehistory and protohistory in Canada and Greenland. Oleson argued that the old Dorset Eskimo and Greenlandic Norse groups blended, both racially and culturally, to produce the Thule culture and its people, that subsequent to this proposed origin Thule culture and people spread throughout Arctic Canada and west into Alaska. That speculative reconstruction embodies so many errors that a critic might despair of listing them in detail. Perhaps it will suffice to say that there is no evidence of a Norse-Dorset blending such as Oleson requires, that there is no evidence that the Canadian Thule culture people were racially blended with Caucasoids, and that there is no reason to believe that Thule culture began earlier in Greenland than in Alaska. The archeological record shows but very scant evidence of Norse-Dorset contact, let alone a cultural blending, that Thule culture people were pure Eskimo in racial type and that the earliest Thule sites occur in the west, not in Greenland. The evidence to support the Oleson-Duason views would of necessity be archeological and yet I am sure no Arctic archeologist would support their speculations. Certainly none has presented an appraisal of Canadian Eskimo prehistory compatible with that attempted by Oleson.

Beginning not later than A.D. 900, Thule migrants gradually wandered eastward from northern Alaska along the arctic coast and northeastward through the High Arctic islands reaching northwest Greenland perhaps about A.D. 1100. Subsequently in Greenland Thule peoples came under the influence of and into close contact with the Viking settlers on that island's southwest coast. As one Thule wave washed onto the Greenland shores, another carried southeasterly crossing Hudson Strait to flow south down the east coast of Hudson Bay to the Belchers and down the Labrador coast to the Strait of Belle Isle.

Although Thule hunters harvested caribou, seals, walruses, birds and fish like their Dorset predecessors, and had a basically similar tundra-adapted way of life, there were marked significant differences between the two. To begin, the Thule had a more effective cultural adaptation to the Arctic: there is only scant evidence of domesticated dogs in Dorset culture but Thule people had dogs, a valuable aid in hunting and, harnessed for sled hauling, a means to increase the range and rate of travel; a second vital advantage for Thule was its possession of the full range of gear for hunting the great baleen whales, a major food supply not available to the Dorset people. Indeed, whaling more than anything else distinguishes Thule culture from earlier and later Canadian Arctic culture periods.

The Thule people were typical, indeed classic, Eskimos in their culture, their language, and their physical type. Skeletons from the several grave finds place them clearly in the distinctive racial sub-group of modern Eskimos. All Eskimologists agree that they spoke the Eskimo language. Their way of life is fully within the Eskimo pattern. Parts of tailored fur clothing including the parka and skin boots, preserved in the permanently frozen soil of Arctic sites, are quite like recent Eskimo dress. They used kayaks, umiaks, sleds and sled dogs, whips, harpoons, spears, lances, fishing gear, and bows and arrows of typical Eskimo type. The same may be said of tools as of weapons. The women's kit, needles, needle cases, the ulu, the soapstone lamps and pots, and wick trimmers that have been excavated have close counterparts in recent Canadian Eskimo culture; and so do Thule culture adzes, drum parts, snow knives, dippers, seal scratchers, snow goggles, sealing stools, snares, drying rack fragments, snow beaters, bow drill parts, and snow probes. Even the amulets and the toys such as the *ajaqaq* (a cup and ball variation using pierced bone and pin), wooden dolls, model boats, weapons, and utensils echo the commonalty of Thule culture and recent

Canadian Eskimo life as the latter was seen by the early European explorers and whalers. Indeed, the arrow that struck Martin Frobisher in the buttocks as he fled to the beach of Frobisher Bay was delivered from a Thule bow by a Thule culture Eskimo whose unsuspecting ancestors had come all the way from Alaska for the event. One may safely conclude that racially and culturally the modern Canadian Eskimo descended from the old Thule culture population.

Its winter villages reflect the more effective Arctic adaptation of Thule culture as compared to Dorset. Thule winter villages commonly contain six to 30 rather large solid houses made of stone slabs and sods set over a whale bone framework; these have a cold-trap entrance passage, raised flagstone sleeping platforms, a flagged floor and various little storage cubicles, food bins and pantries. Usually they are partly underground, often set into a gently sloping gravel hillside facing the sea. Dorset houses, on the other hand, are usually less elaborate, smaller, and in winter clusters of only about three to 15 in number. Like the Dorset people, Thule Eskimos used skin tents in summer and in winter they built snow-houses, perhaps only for temporary camps.

As Thule replaced Dorset over a vast area that replacement must have taken some time and undoubtedly ideas were exchanged between the contending cultures. Eskimo folk tales include numerous accounts of the Tunit or old people who were, in fact, the Dorset population. It seems likely that Thule people learnt of the snow-house from Dorset for it is not an Alaskan trait. The same might apply to soapstone lamps and pots for prehistorians have not found these in Birnirk, the Alaskan culture ancestral to Thule. Also some Thule types of harpoon heads suggest the copying of Dorset harpoon head styles. Nor was the borrowing in one direction only, for it seems that the latest stage of Dorset house types incorporated the cold-trap entrance passage copied from the new Thule subdivisions. It must have been a valuable innovation since both Thule and Dorset people faced a worsening phase of climate after A.D. 1100 in the eastern Arctic.

Coming down the west coast of Greenland, Thule wanderers soon contacted the Vikings who had begun settling in southwest Greenland a few score years before. The Vikings had considerable influence on the Thule Eskimo in Greenland and, over the generations, much contact with them. But there too, deteriorating climate (and a lack of concern in Europe) squeezed the Norse settlements out of existence, so that in the 15th and 16th centuries the diminished remnant of Norse Greenlandic culture blended with its Viking-influenced Eskimo matrix.

The fourth and final state in Canadian Eskimo archeology is that of the recent Central Eskimo which can be dated from the 18th century. The recent people derive directly from the Thule culture population; but there are differences and they are largely a result of a gradual collapse in, and virtual end to, the Canadian Eskimo hunting of baleen whales which had been an economic mainstay of the culture. When whale hunting declined, the large permanent villages of sturdy winter houses were abandoned, for a more nomadic life was required now that the people became increasingly dependent on the more scattered herds of seals and walruses. Thus there was a gradual shift to the snow-house on the sea ice as the customary winter residence. Further, the "Little Ice Age", a time of harsher climate from 1650 to 1850, seems to have forced a withdrawal of population from the northernmost Canadian islands – Ellesmere, Devon, Somerset, Cornwallis and Bathurst – that the Thule people had settled, east to Greenland and south to the south coast of Victoria Island, Boothia Peninsula, and Baffin Island. That "Little Ice Age", bringing more extensive ice cover and shorter seasons of open water may partly explain the decline in Thule culture whaling. The whales' summer range might also have been shrunk by a decreasing depth of sea passages caused by the continuing post-glacial rise of the land. Third, the diligence of European whalers in northern waters may have reduced the supply of whales available to Thule harpooners. In fact very little is known of this transition except, of course, the matter of whaling and the very minor changes in styles of harpoon heads and other fragments whose study writes the prehistory just summarized.

An Individual View of Canadian Eskimo Prehistory

by Robert McGhee*

Released from its burden of glacial ice only a millennium or so later than the remainder of Canada, the Arctic regions must have rapidly taken on the appearance which they retain today. Tundra plants, and the animals which they support, dispersed northward behind the retreating ice and from relict areas within the Arctic zone, and probably occupied the entire area by the time that the last vestiges of ice were melting in Keewatin and retreating around the present remnant ice caps on the eastern and High Arctic islands. By at least 5000 B.C. the area must have been suitable for human occupation, yet for the following 3,000 years such occupation was limited to the southern fringes of the tundra zone. Caribou hunters, almost certainly American Indians, made seasonal forays into the southern edges of the Barren Grounds as early as 500 B.C. Maritime Archaic Indians, hunters of sea mammals as well as of caribou, had penetrated the Labrador coast by 5000 B.C. and perhaps as early as 7000 B.C. The northern Barren Grounds, the Arctic coast, and the islands of the Arctic Archipelago, remained unoccupied not because of a lack of resources, but because of a lack of people who knew how to build a way of life around the resources which were there.

The Paleo-Eskimos

During the centuries around 2000 B.C. the climate of Arctic Canada appears to have been somewhat warmer than it is today. Both in the Mackenzie Delta and in Keewatin the northern forest limit was significantly to the north of its present position. Pollen analysis in northern Greenland indicates a much heavier local vegetation at this time, and dated driftwood from the same area indicates open-water conditions in an area where today the sea is permanently frozen. Similar differences from modern vegetation and sea ice conditions can be expected to have occurred throughout the Arctic zone. The populations of both land and sea mammals, or birds and fish, must have been at least as great as, and probably greater than, those of the historic period. In the absence of man, these animals must have been bold, curious, and potentially easy prey to human hunters.

Into this tundra garden of riches moved the people whom we know as the Paleo-Eskimos. The name was coined early in this century by Steensby, who applied it to the hypothetical ancestors of the modern Eskimos. On the basis of ethnographic analysis, Steensby postulated that the Paleo-Eskimos were an interior hunting people of the Barren Grounds west of Hudson Bay, who had moved in the distant past northward to the central Arctic coast, and there developed the ice-hunting techniques characteristic of the historic Central Eskimos.

Archeology has not vindicated Steensby's ideas, and we now look westward to Alaska or beyond for the ancestors of the Eskimos. The people presently referred to as Paleo-Eskimos are those seen archeologically as the bearers of the Arctic Small Tool tradition. This technological tradition has been suspected to derive either from the interior Siberian Neolithic, from the Pacific coast regions of Alaska, or from interior Alaska. Whichever alternative finally proves correct, we can be fairly certain that the Paleo-Eskimos developed their distinctive adaptation to the zone of tundra and frozen Arctic coasts in the coastal regions of western or northern Alaska.

The Arctic Small Tool tradition in Alaska, represented by the Denbigh Flint Complex and allied complexes, has been supposed to date as early as 3000 B.C. No clearly acceptable radiocarbon dates older than 2000 B.C. have yet appeared, however, and it seems likely that all presently known variants of the Arctic Small Tool tradition in Alaska date mainly to the period between 2000 and 1500 B.C.

Much earlier dates have been reported from the eastern Arctic: a large mixed Paleo-Eskimo site in southern Baffin Island has been dated to 2740±380 B.C., 2510±100 B.C., and 2117±73 B.C.; another, near Frobisher Bay, is dated to 2190±130 B.C. In northern Baffin Island a site dates to 2435±155 B.C., and another near Igloolik to 2008±168 B.C. and 1965±135 B.C. These early dates are all obtained on sea mammal bone, ivory, or burned sea mammal fat, materials on which archeologists in the wood-poor regions of Arctic Canada have relied heavily in building radiocarbon sequences. However, several people have noted that dates on sea mammal material are consistently older than dates on associated wood charcoal or material from terrestrial animals. James Tuck and myself have recently proposed that, at least for the present, dates on material originating in the marine reservoir should be ignored in the establishment of archeological chronologies. The new dating scheme which results from the discarding of sea mammal dates has several advantages over the old, in terms of comptibility with cultural evidence. This new dating scheme is followed in the personal view of Eskimo prehistory which is presented below.

Independence I Culture

The earliest acceptable dates on Paleo-Eskimo material in the eastern Arctic come from northern Ellesmere Island and the north coast of Greenland, where a series of 12 dates on local willow charcoal range between 2000±120 B.C. and 1670±120 B.C. These dates are associated with a distinctive Paleo-Eskimo variant named Independence I by Eigil Knuth, who has spent the past quarter of a century tracing the remains of these people across the entire barren northern coast of Greenland. Related material has been found in High Arctic Canada, in northern Ellesmere Island, northwestern Devon

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Island, and from near Resolute on Cornwallis Island. A few traits reminiscent of Independence I culture have been noticed in collections from multi-component Paleo-Eskimo sites in more southerly regions of the eastern Arctic, for example, in southern Baffin Island, on Mansel Island in northern Hudson Bay, and in Pelly Bay. A site in Saglek Bay, northern Labrador, has a Paleo-Eskimo assemblage somewhat similar to that of Independence I, and its date of 1880±115 B.C. is the earliest acceptable radiocarbon date on a Paleo-Eskimo site in Low Arctic Canada.

Independence I has been generally considered to be merely a High Arctic variant of the more widespread Pre-Dorset culture of Arctic Canada. Recognition of Independence I-like traits in sites from Labrador to Ellesmere Island, along with the revision of the dating sequence mentioned above, suggests that the earliest Paleo-Eskimo immigrants to Arctic Canada may have brought with them a material culture resembling Independence I. Since these people were apparently living in the eastern Arctic by 2000 B.C., their ancestors must have begun drifting eastward from Alaska at least one or two centuries earlier. No material resembling Independence I has yet been found in Alaska, but we may suggest that such material will be found and that it will date several centuries earlier than the Denbigh and related complexes now thought to be characteristic of the early Paleo-Eskimo occupation of Alaska.

The findings of Knuth in Greenland and Ellesmere Island, and my own work around Port Refuge on the northwest coast of Devon Island, allow us to sketch the material culture and way of life of these first Paleo-Eskimo occupants of Arctic Canada. The chipped stone tool assemblage of the Independence I people is, in terms of artifacts classes, typical of the Arctic Small Tool tradition.

However, compared to other Arctic Small Tool tradition assemblages the tools are large and made with a distinctive flaking style. Fine and highly coloured flints were used, and one gets the impression that aesthetic factors contributed to the distinctive character of the stone tool industry.

The organic tool industry is not well known, the only artifacts commonly found being small flint-flakers of cut bone, and bone needles with circular cross-section and tiny round eyes. Only two small, non-toggling, harpoon heads have been found, both from a single ruin at Port Refuge in northwest Devon Island. This type of harpoon head is unique among known Paleo-Eskimo cultures, all of which used toggling harpoon heads, and suggests a link with the cultures of Asia and the North Pacific areas where such non-toggling heads have a great time-depth.

The most distinctive archeological features left by these earliest Paleo-Eskimos in Arctic Canada were their living structures, the "mid-passage ruins" first recognized by Knuth. The ruins, probably the interior arrangements of skin tents or of houses with walls built of sod or snow, consist of a central hearth-box built of vertical stone slabs, sometimes flanked by two parallel rows of upright slabs running from front to back of the structure. The hearths occasionally contain charcoal, burnt bone, and boiling stones. The outlines of the structure are occasionally marked by a few rocks or a gravel rim, are either oval in shape or rectangular with rounded corners, and enclose a sleeping area on either side of the mid-passage. These structures are generally found on ancient gravel beaches raised far above present sea level as a result of glacial rebound, and are characteristically arranged in long lines along a single beach with a considerable distance separating each structure from its neighbors. The isolated and linear character of these settlements, along with the scarcity of archeological remains associated with any single structure and the inconspicuous appearance of the structures themselves, would seem to preclude the finding of Independence I sites in areas where ancient beaches are covered with vegetation growth (which may be the reason why such settlements have not been found in Alaska and in most regions of Low Arctic Canada).

Knuth has characterized the Greenland Independence I people as musk-ox hunters, who also took birds, char, and occasional seals. The Port Refuge People were apparently engaged in coastal seal and bird hunting, and no caribou bones and few musk-ox bones were found on their dwelling sites. Subsistence varied with the local availability of resources, and probably involved seasonal use of both land and sea mammals. We cannot estimate population size, but the findings of several isolated structures and small groups of two to five structures suggest that during the season that these dwellings were occupied, the population was split into small groups of from two to 10 families. Slight evidence suggests that the mid-passage dwellings were used both during the summer and winter seasons, but it is also possible that these people had developed techniques for living on the winter sea ice and if so, larger population groupings may have occurred in the winter villages. The sparseness of archeological remains suggests that population density may have been rather low compared to that of the historic period.

The area occupied by the Independence I people extended far to the north of that occupied in historic times, reinforcing the evidence from pollen analysis which indicates that climatic, sea ice and faunal conditions have deteriorated since the period around 2000 B.C. These conditions, along with the fact that game animals in the central and eastern Arctic had no experience of human hunters and were consequently easy prey, must have attracted the early Paleo-Eskimo groups in the human vacuum of the central Arctic and continued to entice them eastward and northward until they reached Labrador and Greenland. We can only guess at the actual mechanisms through which this migration or expansion came about. The archeological evidence of small settlement size, low population density, and sparseness of midden deposits at any known site, suggests that small groups which probably

consisted of a few related families were self-sufficient and highly mobile. The settlement pattern, in which no man built his dwelling closer than 20 metres to that of a neighbour (or apparently to an old and abandoned ruin), suggests the existence of poorly understood social factors which may relate to the low population density and the wide geographical area covered by the early Paleo-Eskimo people. The decision to move into new areas must have been made for a variety of reasons, and social factors, such as feuds and disagreements within the band or between neighbouring bands, were probably among the reasons for many such decisions. Certainly the existence of unoccupied territory to the east provided a handy solution to any such tense social situations. Travelling by foot, back-packing or dragging their belongings to a new area which would support a complete seasonal cycle of subsistence, it must have taken the Paleo-Eskimos several centuries to complete their original occupation of Arctic Canada. Many local groups must have starved through lack of experience in a new region, and their places may have been filled by later groups continuing to move eastward. It seems likely that the eastward expansion from Alaska continued for at least a few centuries, the later migrants bringing with them a material culture which is recognizably different from that of the earliest pioneers, and never reaching the High Arctic regions of Ellesmere Island and Greenland.

Pre-Dorset Culture

No site dated later than about 1700 B.C. shows the distinctive characteristics of the Independence I culture. All sites dated to between roughly 1700 and 900 B.C. in Arctic Canada share a different set of traits, and it is merely convenient to lump these sites and the cultures which they represent into the category "Pre-Dorset". The earliest acceptable dates on Pre-Dorset sites are 1710±140 B.C. on charcoal from Thalia Point on the central Labrador coast, and 1742±300 B.C. and 1602±128 B.C. on antler from the Parry Hill site near Igloolik.

Pre-Dorset culture is best known in the area of Fury and Hecla Strait, northern Hudson Bay, and Hudson Strait, which region now constitutes the "core area" of Paleo-Eskimo occupation in Arctic Canada, and appears to have supported continuous occupation for the following 2,500 or so years. Most of our large collections come from this region, suggesting that its variety of land and sea resources supported a denser Paleo-Eskimo occupation than other areas. In contrast, all other regions of Arctic Canada appear to have been occupied discontinuously, probably by people who expanded sporadically from the core area into the various peripheral regions of Paleo-Eskimo occupation.

In the early part of the Pre-Dorset period, between roughly 1700 and 1500 B.C., sites are known within the core area at Igloolik, Lake Harbour and Frobisher Bay in southern Baffin Island, Mansel Island, and Ivujuvik on the Quebec coast of Hudson Strait. In the peripheral regions, occupation extended down the Labrador coast as far as the Thalia Point site near Nain, and northward to sites in northern Baffin Island and the Cape Sparbo and Port Refuge areas of Devon Island. The west coast of Hudson Bay may have been occupied as far south as the Churchill area. A small and undated site north of Great Bear Lake is the only one known in the central Arctic which may date to this time, although other sites doubtless exist and will be found.

Our knowledge of Pre-Dorset culture is plagued by small collections and by a scarcity of published information.

The stone tool industry of Pre-Dorset culture is again typical of the Arctic Small Tool tradition in terms of artifact classes, but it lacks many of the distinctive artifact forms of Independence I. Soapstone lamps, small and round or oval in shape, have been reported from Igloolik and from one site in northern Baffin Island. Bone tools are known from only a few sites and include toggling harpoon heads, fish spear prongs, possible antler arrowheads, flaking tools, needles with circular cross-sections and small round eyes, and a variety of unidentified artifacts. The harpoon heads are known from the earliest levels at Igloolik, from north Baffin Island and Devon Island. James Tuck has suggested that these earliest Paleo-Eskimo toggling harpoons may have originated through contact with Maritime Archaic Indians who were using somewhat similar specimens at about this time in Labrador.

No distinctive dwelling structures have been found in association with Pre-Dorset culture. At a few sites, such as those near Igloolik, on Mansel Island and Devon Island, dwelling areas can be isolated but these are merely circular or oval concentrations of living refuse with no evidence of a periphery structure or of a specialized central structure such as the mid-passages of the Independence I culture. We must guess that the Pre-Dorset people lived in skin tents, and perhaps in houses with sod or snow walls. Settlements are now more concentrated, lacking the linear aspect of Independence I settlement patterns and the amount of refuse associated with many of these sites indicates continuous or sporadic occupation over long periods of time. One gets the impression of a greater population density than that of the Independence I people, and perhaps of larger settlements in areas which would support a large population. Subsistence was based on interior and coastal hunting of land and sea mammals, perhaps including winter ice hunting, and must have varied depending on the existence of local resources. There is still no evidence of boats, nor of dogsledding although a few bones which have been tentatively identified as those of dogs have been found. No Pre-Dorset burials have been found, and we may suspect that corpses were exposed on the surface, as was the practice of the historic Eskimos of the central Arctic.

Knowledge of Pre-Dorset culture between roughly 1500 and 900 B.C. is poor. Although the core area continued to be

occupied, there is evidence of occupation in the High Arctic and at present no sites in Labrador can be confidently dated to this period. The earlier occupants of these areas may well have become extinct, perhaps as the result of a climate which was deteriorating toward present conditions from the relatively warm levels of the period around 2000 B.C. A single site near Great Whale River on the east coast of Hudson Bay, and others near Churchill, are the only evidence for occupation of the regions around Hudson Bay.

A distinctive Pre-Dorset variant did occur, however, on Banks and Victoria islands and in the western Barren Grounds from Coronation Gulf perhaps as far south as Lake Athabaska. The earliest radiocarbon dates on this occupation are 1490±160 B.C. and 1470±150 B.C. from the Umingmak site in northern Banks Island. Five dates from Wellington Bay in southern Victoria Island range between 1230±120 B.C. and 930±105 B.C. On the mainland, the Bloody Falls site on the Coppermine River dates to 1350±90 B.C. and a site near the junction of the Thelon and Hanbury rivers is dated at 1210±95 B.C., 940±125 B.C., and 890±95 B.C.

These sites share a number of technological traits and are caribou or musk-ox hunting stations, or interior fishing sites; no coastal sea-mammal hunting sites have yet been located. Although it is almost certain that the people living on Banks and Victoria Islands and around Coronation Gulf did have a seasonal maritime adaptation, perhaps spending part of the winter on the sea ice, their relatives in the interior of the Barren Grounds must have developed a purely interior way of life. The distribution of interior sites roughly coincides with the present migration of the caribou herds which winter in the forests around Great Slave Lake and Great Bear Lake and during the summer move north toward the Arctic coast, and during the 19th century, on to Victoria Island. We may suspect that the Pre-Dorset occupants of the Barren Grounds became involved in intensive caribou hunting around Coronation Gulf or Bathurst Inlet, and from there moved southward into the interior.

This is the only evidence which we have of a Paleo-Eskimo group developing a complete interior adaptation, and this adaptation apparently lasted for only a few centuries. After 900 B.C. there is no indication of continued Paleo-Eskimo occupation of the Barren Grounds or of the central Arctic Islands, and again we may suspect that extinction of local populations occurred. The Paleo-Eskimo abandonment of the Barren Grounds may have coincided with Indian reoccupation of this region, since radiocarbon dates on apparently Indian caribou hunting sites appear as early as 1075±90 B.C. at Aberdeen Lake in central Keewatin, and 1190±120 B.C. and 780±90 B.C. on a single sample of caribou bone from the site at Bloody Falls a few kilometres south of Coronation Gulf. We may suspect that relations between the small bands of Indians and Paleo-Eskimos roaming over the Barren Grounds at this time were as hostile and as fraught with fear as were those between the 18th century Chipewyan and Copper Eskimos as witnessed and described by Samuel Hearne. Whatever the reason, the disappearance of these central Arctic Paleo-Eskimos around 900 B.C. provides a convenient marker for the end of the Pre-Dorset culture.

Dorset Culture

Between 1000 and 500 B.C. a marked change occurred in the material culture of the Paleo-Eskimos occupying the eastern Canadian Arctic and Greenland, resulting in a distinctive archeological phase known as the Dorset culture. Several Pre-Dorset artifact types disappeared at this time, and there was a decline in the extremely fine flint-working techniques and miniaturization which characterized the Pre-Dorset stone industry. On the other hand new elements appeared including rectangular soapstone lamps, sled-shoes and, possibly, snow knives. A rectangular semi-subterranean winter house appeared, with sleeping platforms along either side of a central passage or hearth area, and apparently with walls of either sod or snow.

Only in the Igloolik region has *in situ* continuity between Pre-Dorset and Dorset cultures been convincingly demonstrated, and here Meldgaard sees the development as an extremely rapid evolutionary change occurring over one or two centuries around 1000 B.C., with little or no influence of diffusion from cultures outside the eastern Arctic. Taylor and other writers concur that Dorset culture is essentially an evolutionary development which occurred in the eastern Arctic, but the details of the transformation from Pre-Dorset, that is, the causes and the rate at which the transformation took place, are not at all clear.

The idea of an extremely rapid and perhaps traumatic cultural change is based on the comparison of relatively early Dorset radiocarbon dates obtained on walrus ivory and seal bone with late Pre-Dorset dates obtained on terrestrial substances. If we ignore the dates on sea mammal material, for the reasons mentioned previously, we get a somewhat different picture of Dorset development. The earliest acceptable dates now come from High Arctic Greenland and from Labrador. In northern Greenland and the Canadian High Arctic a relatively distinctive culture described by Eigil Knuth and named Independence II, shares several traits with the Dorset culture of the Igloolik region, yet lacks other characteristic Dorset elements. Local willow charcoal from Independence II ruins has given dates of 1130±100 B.C., 660±100 B.C., and 560±110 B.C.

In the Groswater Bay region of the central Labrador coast, an early Dorset phase has yielded eight charcoal dates ranging between 740±140 B.C. and 250±120 B.C.; a charcoal date 535±185 B.C. was obtained at an early Dorset site in

Saglek Bay, northern Labrador. The Labrador material may be transitional between the Pre-Dorset and the Dorset.

In the Paleo-Eskimo core area of the eastern Canadian Arctic, the earliest date on terrestrial material associated with a Dorset occupation is 446±137 B.C. on antler from a site near Igloolik.

These dates suggest that fully-evolved Dorset culture did not appear until around 500 B.C., and allow up to five centuries in which to accomplish the transition between late core area Pre-Dorset and early classic Dorset. The absence of dates from the core area during this period can likely be ascribed to bad luck rather than to a hiatus in the occupation of the region, since Meldgaard convincingly demonstrates a continuous development of lance and harpoon-head styles at Igloolik. The rate of technological change suggested by this new dating scheme is not markedly greater than that seen in any other 500-year period of Paleo-Eskimo history. We may begin to suspect the "cultural break" between Pre-Dorset and Dorset to be an artificial archeological phenomenon imposed by lack of evidence, and by the coincidental appearance of a few technological items which are probably of greater significance to the archeologist than they were to the people who made and used them. Perhaps we should look for the source of these cultural introductions in Greenland, where the Independence II culture shows a blend of Independence I, Pre-Dorset, and Dorset-like traits at a time which may be earlier than the appearance of Dorset culture in the eastern Arctic core area.

Whatever the process of technological change which led to the development of Dorset culture, there is no good evidence of a significant change in the demography, economic adaptations, or general way of life between Pre-Dorset and Dorset times. Several writers have suggested an increasing emphasis on marine resources in the Dorset period, but these suggestions are based on little evidence. We cannot demonstrate the use of boats, dogsleds, bows and arrows, bladder harpoons, or any other major items of technology which might have produced a significant change in the ecologic adaptation of the Dorset people.

The subsequent history of Dorset development remains one of confusion. Technology continued to undergo stylistic changes, the change probably occurring at different rates during different periods, but there is no good evidence of basic changes in demography or economic patterns. A very distinctive artistic style was developed, probably related to shamanistic activities and involving miniature animal carvings in ivory or wood, carved human dolls or figurines, and various masks and mask-like representations of a stylized human face. The remains of this carving activity become more frequent through time, suggesting an increasing intensity of religious or artistic involvement.

The core area of Fury and Hecla Strait, northern Hudson Bay, and Hudson Strait, was probably occupied continuously up to A.D. 800 or 1000, or possibly even later as suggested by an antler date of A.D. 1350±150 from a site near Igloolik. Occupation of the fringe areas continued in the old Paleo-Eskimo pattern of immigration, probably in most cases by people moving from the core area because of disagreements with their neighbours, occupation by a more or less culturally distinctive group for a period of a few centuries, followed by disappearance which in most cases is probably an archeological reflection of local extinction.

A distinctive Dorset variant occupied the Victoria Island and Coronation Gulf region of the central Arctic, where dates range from 220 B.C. to A.D. 90±100; however, all of these dates are on driftwood charcoal and may be a few centuries too early. The western coast of Hudson Bay may have been occupied at about the same time, although the evidence is limited to a few finds in the Chesterfield Inlet region and the Dorset component of the site near Churchill.

In Labrador there is little evidence of Dorset occupation after A.D. 700, but during the last few centuries B.C. the Dorset people expanded south to the island of Newfoundland. The entire coastal regions of Newfoundland supported a culturally distinctive Dorset occupation which probably lasted until about A.D. 500 before becoming extinct. One of the distinctive features of Newfoundland Dorset culture was cave burial. The Dorset skeletons which have been recovered from these burials are the only Paleo-Eskimo skeletons so far known, but are sufficient to prove the characteristically Eskimo physical type of this population.

During the centuries preceding A.D. 1000 there was a major Dorset expansion: westward into the central Arctic islands, northward into the High Arctic as far as Melville Island in the west and the Thule district of Greenland in the east, and southward along the Hudson Bay coast of Nouveau Quebec. This late Dorset period is marked by new types of harpoon heads, an apparent proliferation of wood and ivory carvings, and mid-passage tents or houses with central hearths flanked by upright stones which served as pot rests. These elements mark the greatest extent to which Dorset occupation spread at any one time, and also characterize what appears to have been the final flourish of the Dorset culture. Only in Nouveau Quebec is there good evidence for Dorset occupation after A.D. 1000. In the Richmond Gulf area, Elmer Harp has received charcoal dates of A.D. 1105±120, A.D. 1155±120, and A.D. 1400±120 associated with Dorset houses. A site on Payne Lake in the Ungava interior has yielded a wood date of A.D. 1150±100, and caribou bone dates of A.D. 1241±94 and A.D. 1301±100. Along the Hudson Strait coast of Ungava there appears to have been a later Dorset occupation which indulged in the construction of large rectangular stone structures, and whose remains have been ascribed to Norse occupation. Although it is quite conceivable that there was Norse contact or trading with the occupants of the eastern

Canadian Arctic at about this time, no certain remains of Norse occupation have yet been found.

Neo-Eskimo Phase: Thule Culture

The development of Eskimo cultures in Alaska over the past 400 years stands in marked contrast to the adaptational stability of the Paleo-Eskimos in Arctic Canada. Larger populations and a greater variety of resources and environmental zones in Alaska resulted in a greater degree of local cultural differentiation, and a sequence of technological and adaptational changes which led to the development of the maritime-oriented "Neo-Eskimo" cultures. By roughly 2,000 years ago the Old Bering Sea Eskimos of the Bering Strait region had developed the large skin boat (umiak), float harpoon, and other equipment which allowed them to undertake open-water hunting of large sea mammals including the bowhead whale. The use of these resources may have resulted in an increase in population, certainly led to a more sedentary way of life, and was associated with the development of large permanent Neo-Eskimo villages of semi-subterranean winter houses. Arctic Canada was isolated from these events; the 500 kilometres of barren and unproductive coastline between Cape Bathurst and Dolphin and Union Strait seems to have served as a buffer between Alaskan and Canadian Paleo-Eskimo populations, as it did in later times during the centuries preceding European contact.

By A.D. 500 a distinctive Neo-Eskimo culture had developed along the north coast of Alaska, but apparently did not penetrate east of the Mackenzie River. Dennis Stanford's recent work at Point Barrow indicates that these Birnirk culture people lived in permanent winter villages, hunted seals, walruses, and caribou, but made little use of bowhead whales which migrate along this coast in spring and fall and which were an important resource to the historic North Alaskan Eskimos. Whaling was first practiced on this coast around A.D. 1100, was associated with stylistic changes in several technological items, which development can conveniently be taken to mark the origin of what is known archeologically as Thule culture.

Several writers, including myself, have postulated that the origin of the North Alaskan whaling industry and of Thule culture was related to a warm climatic period which is evidenced throughout the northern hemisphere around A.D. 1000. This same phenomenon may have encouraged the Thule people to expand eastward into the relatively ice-free waters of the Canadian Arctic, which in Thule times supported summer populations of bowhead whales and other sea mammals well beyond the present range of these species. This hypothesis still seems worthwhile, despite the fact that our dating of the Thule expansion is not adequate to demonstrate a close temporal coincidence of climatic and cultural events.

Aside from dates on driftwood and sea mammal material, the earliest Thule radiocarbon date comes from Nugdlit in northwestern Greenland, where willow from a Thule house is dated at A.D. 910±100. Despite the fact that this site is typologically the earliest in the eastern Arctic, the date is possibly a century or more too old as it was obtained on an old museum specimen which may have been treated with preservatives. In Arctic Canada, the earliest acceptable dates are A.D. 1090±90 and A.D. 1235±60 from northern Baffin Island; A.D. 1110±60 from Bloody Falls on the Coppermine River; A.D. 1130±100, A.D. 1140±100, A.D. 1140±100, A.D. 1140±70, and A.D. 1260±90 from sites around Chesterfield Inlet; A.D. 1255±90 and A.D. 1480±80 from Richmond Gulf on the east coast of Hudson Bay; A.D. 1245±120 from southern Victoria Island; and A.D. 1350±105 at Cape Parry in Amundsen Gulf. This series of dates suggests that the main thrust of the Thule movement into Arctic Canada occurred between A.D. 1100 and 1400, and that by the latter date the Thule occupation had spread throughout most of the central and eastern Arctic.

The average size of a Thule winter village is four or five houses, suggesting that the migration or population expansion was carried out by small groups of perhaps 20 to 50 people who travelled together and who cooperated in hunting whales and other game. Such groups, travelling in umiaks during the summer and depending on a wide-ranging and evenly distributed food resource, the bowhead whale, must have been highly mobile. As in the case of the original Paleo-Eskimo occupation of Arctic Canada, we must imagine that social as well as economic factors influenced the many decisions which repeatedly took small groups of Thule people eastward into unknown territory.

The distribution of stylistically early Thule collections suggests that the initial expansion occurred, probably during the 11th and 12th centuries, along the coasts of the Beaufort Sea and Amundsen Gulf, then north to Lancaster Sound and across Parry Channel to Baffin Bay and northwestern Greenland. Sites along this entire route are littered with whale bones, indicating that during the time of Thule expansion the distribution of the western Arctic bowhead whale and the eastern Arctic Greenland whale (both *Balaena mysticetus*) was continuous across Parry Channel. A secondary expansion probably occurred during the 12th to 14th centuries, taking Thule people southwards both into areas such as Hudson Bay where whaling could be carried on to a limited extent, and into areas such as Coronation Gulf where seals, caribou, and fish were the only resources available. Some areas, including Labrador, may not have been occupied until the 14th or 15th centuries.

We suspect that the Thule Eskimos encountered their Dorset predecessors in some areas of Arctic Canada, but the nature

and extent of contact is not known. Archeological evidence of such contact is slight, involving a few sites where Dorset artifacts are found within houses built in the Thule manner, and the odd artifact which may show a blend of Dorset and Thule styles and techniques. Certain elements of eastern Arctic Thule culture, including harpoon heads with transverse line holes, soapstone pots, and possibly the domed snow-house, may have been developed from Dorset prototypes. Canadian Eskimo legends of a race called "Tunit", which occupied the country before the ancestors of the present people, may refer to the Dorset population. If and when contact did occur, it was probably slight, almost certainly hostile, and contributed little to the culture or adaptation of the Thule people.

Contact with Thule groups had a more significant effect on the people of the Dorset culture, in that it may have been a primary or at least a contributing cause of their apparent biological and cultural extinction. The Dorset population may well have been in decline prior to the Thule invasion, perhaps because of the same climatic changes which encouraged the eastern movement of Thule people, and Dorset populations may have survived only in isolated areas. In contacts between the two groups, the superior aggressive instincts of a people whose culture was developed in the large communities of Alaska must have inevitably won out over the wary hostility of a small and scattered Canadian Arctic population. Displaced from the best sealing locations, or from caribou drives and fish weirs on which one aspect of their seasonal economic cycle depended, local Dorset populations may have been starved to extinction without ever coming into direct contact or combat with the newcomers from the west.

The technology and way of life of the Thule people was essentially Alaskan, and during the early period of their movement into Arctic Canada there was apparently little need for adaptation to different environmental conditions. The North Alaskan semi-subterranean winter houses with rear sleeping platform, cold trap and entrance tunnel, were now built with stone rather than wood. The umiak and kayak continued to be used for summer travel and hunting in the relatively long open-water seasons of the period. Dog sledding equipment appears in early Thule sites, and it has been suggested that dog traction may have been invented by the early Thule migrants to Arctic Canada. Almost the entire technology of the historic Canadian Eskimos can be traced back to that brought from Alaska by their Thule ancestors: the composite bow and antler arrowhead, the toggling harpoon and harpoon float gear, fish and bird spears, snow goggles, men's and women's knives of ground slate, wood trays and buckets, artistic motifs, and a multitude of other items of technological and non-technological culture. The Thule people also brought a dialect of the Inupik Eskimo language, and this is the linguistic ancestor of all the closely related dialects now spoken between Bering Strait and Greenland.

The Extent of Prehistoric Eskimo Occupation in the Canadian North

Phase I: The Arctic Prehistory Mapping Workshop

In early March 1974 three Arctic archeologists met in Hamilton to compile prehistoric Arctic land use maps.

Moreau S. Maxwell, Robert McGhee and William C. Noble at this initial workshop marked on a map at 1:4,000,000 scale approximate locations of all prehistoric Eskimo sites reported in the archeological literature, or otherwise known to them, pertaining to northern Canada, Newfoundland-Labrador and northwest Greenland (Smith Sound region). Sites were marked on one or more of four separate maps illustrating respectively, Thule culture sites, Dorset culture sites, early Paleo-Eskimo sites, and sites of "unknown age".

In addition to sites reported in the archeological literature, sites that had recently become known, e.g. as a result of geological or resource exploration activity, or were reported in early explorers' accounts, were also added to the appropriate maps. A total of about 400 separate site locales was assembled in the three days of the workshop. However, a single "site" location marked on a base-map might represent a cluster of habitation sites at the actual location; the scale of the mapping (65 miles to the inch) precluded any more precise representation of sites, though this level of generalization appeared appropriate given the approximately 1.5 million square miles of territory under investigation.

Sites were defined not only as house remains, but included tent rings and stone structures other than habitations. This allowed the inclusion of ancient sites recorded in certain 19th century explorers' accounts (e.g. Otto Sverdrup *New Land* 1904).

For the most part, sites reported in other than the archeological literature were assigned to the map depicting sites of unknown age. However, any site which contained large whale bones as a building material was deemed to be of Thule culture provenience, and was so designated. The rationale here was that a 90-per cent probability existed that all whalebone houses dated from Thule times; therefore the chance of error in assigning all such structures to the Thule culture was minimal and could be effectively ignored.

Following the plotting of site locations, an outer boundary was drawn around the peripheral sites to encompass the presumptive land use areas associated with marked sites. Certain assumptions entered in this stage of the work.

1. All Eskimo cultures in the north included a dual land and sea (or sea ice) subsistence phase, so that a certain extension of land use margins both landward (for caribou hunting) and seaward (for marine mammal hunting) was warranted. The distance deemed reasonable was to accord with such extensions from the habitation sites as could be reasonably covered on foot.

2. Areas for sea or sea ice hunting would exclude those areas known not to be used today for physical reasons (e.g. the central parts of Hudson Bay and Foxe Basin).

3. Land areas not used today (e.g. ice cap areas in the Arctic archipelago) would likewise be excluded.

4. Areas for which archeological evidence was lacking would be treated in one of two ways if the inclusion of such areas would represent an extension of the boundary of presumptive land use:

(a) If the land area considered was physically capable of being occupied, but at this time had not been investigated by archeologists (e.g. the northern parts of Victoria Island), then a question mark was placed over that land area, and that area excluded from the presumptive land use area marked;

(b) If the land area was, in the opinion of the archeologists, never occupied, for physiographic reasons (e.g. much of Axel Heiberg Island), or because of its extreme geographical location (e.g. Prince Patrick Island), then it was excluded and no question mark appears on the maps. Extreme geographical locations for the heavily marine oriented Thule culture would include large areas of the Barren Grounds, on the assumption that coastal caribou populations would meet those people's clothing and food needs without any extensive inland occupation during winter.

Phase II: Consolidation of the Maps

In the summer of 1974, a research assistant, Charlotte Sinclair, used the resources of the Archeological Survey of Canada (in Ottawa) to locate further evidence of prehistoric occupation that might have been missed during the workshop meeting. She received assistance in her search from Louise Eastabrooks.

Further material was supplied by Robert McGhee (pertaining to Newfoundland-Labrador sites) and William B. Kemp (from south and east Baffin Island).

At this time information on prehistoric sites was obtained from project fieldworkers (in conjunction with their gathering cultural data for the Inuit Land Use and Occupancy Project), and, especially in the case of northern Victoria Island, it allowed improvements to the prehistory maps as then constituted.

By the end of the summer of 1974, the maps were redrawn and copies sent to about 75 correspondents who included not only North American and European archeologists with field experience in the pertinent areas, but northern residents, and geographers, geologists, and biologists who had travelled extensively in the Canadian Arctic.

A total of 40 responses was received, which allowed further refinement of the maps, especially in regard to Paleo-Eskimo occupation of northern Manitoba and the Great Bear Lake

area, and Thule occupation of the Thelon system in the central Keewatin.

All such suggested amendments were evaluated by William C. Noble if they appeared in any way equivocal, and boundaries adjusted according to aforementioned criteria.

Phase III: Verification of Results

Given the fragmentary nature of some material used to adduce prehistoric Arctic land use, it was considered prudent to request independent evaluation of the results so far obtained.

For this purpose, four internationally recognized authorities on Arctic archeology were asked to examine and evaluate the map compilations. Accordingly, a copy of each of the four maps of prehistoric presumptive land use and a list of the literature references (arranged by geographical area), used in most cases, were sent to Henry B. Collins, Archeologist Emeritus at the Smithsonian Institution; Elmer S. Harp, Jr., Chairman, Anthropology Department, Dartmouth College, N.H.; Count Eigil Knuth, Director, Peary Land Expeditions, Copenhagen; William E. Taylor, Jr., Director, National Museum of Man, Ottawa. Any amendments suggested by these authorities have been made, and at this time it is confidently believed that the maps published in this report represent the most complete, accurate and reasonable record of Canadian Arctic prehistoric land use that could be assembled from the data presently available (Maps 63, 64, 65, 66).

In comparison with an estimated 1,238,000 square miles of contemporary Inuit land use in the Northwest Territories the Thule population apparently occupied 1,045,000 square miles, and during the greatest extent of prehistoric land use the Paleo-Eskimo population used and occupied 1,127,000 square miles of the present day Northwest Territories.

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In addition to the people mentioned in this report, and the numerous Inuit respondents who located prehistoric sites on maps, we wish to record our appreciation to the following people who responded to our written requests for site information:

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Lambert Conical Projection With Rectified Meridians, Standard Parallels 64 And 68

Lambert Conical Projection With Rectified Meridians, Standard Parallels 64 And 88.


400

Map 66
Site locations: unknown

Lambert Conical Projection With Rectified Meridians, Standard Parallels 64 And 88

Inuit and the Land in the Nineteenth Century

by W. G. Ross*

Introduction

For two and half centuries after Frobisher's first encounter with natives of Baffin Island in 1576 European knowledge of the Inuit of the Canadian Arctic (Map 67) remained scant, based only upon brief contacts here and there; such meetings were tinged with wonderment, suspicion, and sometimes hostility, further constrained by the considerable barriers of dissimilar language and culture, and confined to coastal regions – often to the exploration ships themselves. From such superficial observations no comprehensive picture of the distribution and life of the Inuit could possibly emerge.

However, the conditions of contact changed after 1800. Owing to a number of motivating factors, including the searches for a northwest passage, for the missing men of Franklin's expedition, for the North Pole, and for the tangible rewards of whale products and furs, the frequency of voyages to the northeastern flank of North America increased substantially. Experience with Arctic conditions led to improvements in techniques of living and travelling, so that some came to accept as normal a winter spent on board the vessel, frozen into some entirely remote harbour, and no longer hesitated to roam inland from the anchorages hauling their supplies behind them on sledges.

A few individuals, such as Hall and Schwatka, put complete faith in the Inuit, dwelt and travelled with them, adopted their diet and clothing, and imitated their methods of living off the land and sea. Inevitably, these outsiders learned more about Inuit distribution and way of life, and their published records have subsequently provided the basis for several attempts to reconstruct the broad spatial aspects of Inuit occupancy prior to the era of the trading posts.

For that portion of the Inuit domain that lies within the boundaries of Canada's Northwest Territories, the principal reconstructions have been those of Rink (1887–1891), Boas (1888), Thalbitzer (1904), Steensby (1917), and Wissler (1918). Although differing from each other in originality and scope, objectives, and methods of research, these scholars have generally assumed that in areas beyond the limited range of first-hand ethnographic investigation the published narratives of explorers could provide an adequate source of information for identifying the Inuit presence in different localities.

My intention in this paper is to summarize and comment upon the results of these investigations, in so far as they relate to the geographical extent of Inuit occupancy in the Northwest Territories, and to draw attention to a few other indicators of the distribution of Inuit territory. First, however, it is relevant to examine the circumstances surrounding the early observations of Inuit population by European and American visitors to the Arctic.

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The Nature of Early Observations

For the most part, contact was limited to chance encounters, which occurred when the itineraries and routes of the transient white men happened to intersect those of the seasonally migrant Inuit. On rare occasion, members of both groups, motivated by curiosity and the desire to trade, made special efforts to meet each other, but few such encounters were reliably prearranged or regularly repeated.

The explorers and whalemen travelled mainly along rivers and coasts, almost exclusively in summer, at which season Inuit in some areas tended to be inland beyond the range of observation. However, so anxious were the Europeans to report some news of Inuit habitation that they eagerly described all the signs of occupation in the deserted regions they traversed, such as caches, tent rings, abandoned houses, and even footprints. Understandably, if they were fortunate enough to meet up with a few individuals, they attempted to learn as much as possible about the numbers, movements, and territorial limits of the entire group. In this, their information was mainly second-hand, obtained through the use of interpreters, pidgin English, sign language, or merely the limited scope of their visual observation. The reliability of such early records, as well as their geographical completeness, may therefore be questioned.

Furthermore, opportunities to encounter the Inuit were scattered in time and space – one expedition here, another there, often several years later. Consequently, it is difficult to understand the development of Inuit settlement in one region, to compare different regions, or to reconstruct the broad patterns of Inuit settlement across the entire Canadian Arctic at any one time. Moreover, the visiting white men were primarily explorers, traders, whalemen, and later, missionaries, scientists or policemen; only secondarily were they observers of Inuit life. The location and duration of their sojourns in the Arctic depended upon the exigencies of their particular objectives: to discover and map new territories; to seek for lost expeditions; to secure blubber, oil, baleen, ivory, furs and skins; to disseminate religious teachings; to examine rocks, plants, animals, climate and ice; to establish the white man's law and order. Thus any reports on Inuit numbers, distribution, economic activities and social life such observers made, were usually incidental to their principal objectives in the Arctic regions.

Yet each of these groups did contribute in its own way to the outside world's knowledge of the Inuit. The lengthy traverses of explorers, and later policemen, provided useful regional comparisons; the more sedentary traders and missionaries produced descriptions of the annual cycle in particular settlements or regions; the winterings of whalemen revealed a good deal about the intensity of trade, employment and cultural change in certain localities. Some individuals made outstanding

contributions to the understanding of Inuit occupancy. The most notable of these was Franz Boas who, unlike most of the other transient outsiders, set out specifically to learn about the Inuit. Combining the knowledge gained during residence and travels in southern Baffin Island with information available in earler published works, he produced the authoritative book *The Central Eskimo* in 1888, which described "tribes" from the shores of Davis Strait as far west as King William Island. Other valuable contributions were made by explorers, such as Charles Francis Hall, whose two expeditions to the Canadian eastern Arctic in the 1860's occupied seven years; or by missionaries, such as Emile Petitot who wrote over 90 reports on the Mackenzie River basin and its inhabitants. Among the whalemen George Comer was notable, methodically collecting artifacts and ethnographic information during a number of wintering voyages to Hudson Bay.

Despite such contributions, however, it is clear that the limitations of 19th century material make it difficult to reconstruct a meaningful overview of Inuit land use and occupancy prior to the trading post era. The problem is especially acute, as some of the more difficult information to obtain about an exotic and nomadic people is that relating to the size and distribution of its population. For example, a scientist could learn much about domestic implements, technology or personal roles and relationships by observing life within one small camp. From one capable informant he could gather a wealth of information on origins, beliefs, legends, taboos, and other aspects of intellectual culture. At one abandoned village site he might collect sufficient artifacts to occupy the attention of experts at a museum for months and subsequently lead to statements regarding the material culture of the people. But what he might learn from one individual, one household or one encampment about the numerical and spatial characteristics of the regional population was almost certain to be incomplete and quite possibly inaccurate, for it was not the kind of information that nomadic hunters were likely to possess regarding many others of their group. Eskimos did not have the same obsession with quantities and sizes as did the explorers and scientists, and indeed their perception of these matters was dissimilar and unknown to the visitors. Thus the only way for the outsiders to secure reliable population data was by enumerating every individual, but this was hardly feasible in immense Arctic regions inhabited by small, dispersed, and mobile groups of hunters, especially when there were constraints on the time spent in the field. It follows that one must regard early reports of Inuit population with discretion.

One fundamental consideration is the manner in which Inuit were grouped. It was known during the 19th century that Inuit existed in "tribes", bound together not by political organization and leadership but by similarities of culture, bonds of kinship, the need for mutual cooperation in the quest for food, and a shared regional consciousness. They identified themselves and their neighbours by names of the region occupied, or of a particular place, feature, or characteristic within the region. For example, Puivlirmiut were the people of the region called Puivlik; Kogluktomiut were the inhabitants of the valley of the Kogluktok River, and so on.

These group designations were adopted by early explorers and scientists because these names appeared to be important to the Inuit themselves and because they provided a convenient framework for describing the regional variation in social, cultural and demographic characteristics. Historical data presented in this form may appear to facilitate a reconstruction of Inuit land use and occupancy across the Arctic in the 19th century. Indeed they do, but there are problems nevertheless.

One cannot assume, for instance, that the composition and distribution of the groups have been constant through time. Group membership and boundaries fluctuated in response to several factors, including depopulation caused by famine in certain districts, migration to and from neighbouring groups, availability of game, the seasonal fusion of one group with another, changes in aboriginal trade patterns and contact with Indian and white peoples.

Aside from the inconstancy of group territories the entire matter of assigning names to groups is confusing. Thus a small group on the southeastern part of Victoria Island knew themselves as Kiglinirmiut; to the natives of Bathurst Inlet, however, this name designated all residents of Victoria Island, whereas more distant Inuit used the same name to refer to all the inhabitants of a larger region embracing Bathurst Inlet and Queen Maud Gulf as well. Non-native terminology employed the name Copper Eskimos to represent not only all of these but the tribes of Coronation Gulf and adjacent regions as well.

When seeking a valid reconstruction of 19th century Inuit distribution it is essential to bear in mind these several problems: the confusion of group nomenclature; the inconstant nature and distribution of local groups; the transient and irregular nature of European experience among the Inuit; the difficulty of obtaining regional population data, and the risks of employing, often short-term, observations from different places and periods. Inevitably, these difficulties have imposed limitations on those scholars who have attempted to show the fundamental patterns of traditional Inuit occupancy in North America, and if their results appear very general, even superficial, we must ask ourselves whether the published material permits anything more precise and comprehensive.

Spatial Demands of Inuit Life

Distributed as a "border people" along the northern periphery of the habitable world, the Inuit occupied a severe

environment practically devoid of plant food, in which the search for game demanded a wide variety of ingenious weapons, considerable skill in their use, a high proportion of time spent in the hunt, and a nomadic existence. Many animal species were seasonal migrants, and consequently human settlement patterns appear basically to respond to geographical and temporal variations in the occurrence of game, variations that were more or less predictable and regular from year to year. In most regions Inuit alternated between fairly sedentary maritime residence during the winter months, based primarily upon sea mammal hunting, and a more dispersed and mobile existence in summer, when caribou, musk-oxen and fish were secured at inland localities. The complimentarity of winter and summer, or marine and terrestrial resources, of coastal and inland habitation, was seen as a fundamental characteristic of Inuit life, so much so that the anthropologist Steensby termed the phenomenon a "cultural duality" and identified a winter culture and a summer culture.

Forced by the sparsity and seasonal occurrence of food to exploit the wildlife resources of two distinct habitats, the Inuit by necessity utilized large expanses of territory. Thus population density appears remarkably low, expressed not in the familiar terms of people per square mile but rather as square miles per person. According to Weyer, there were from 120 to 198 square miles per inhabitant in four main regions of the Canadian Arctic. In the more favourable environments of Alaska and Greenland, which benefited from less severe climates, a wider assortment of sea mammals, and greater abundance of driftwood, the densities were far higher, although not greater than one person per three square miles (in the ice-free portions of Greenland).

Conscious of the special importance of marine resources in the annual hunting cycle, Weyer presented figures for the average length of coastline per inhabitant in various parts of Greenland, a ratio that varied from a third of a mile to about eight miles per capita. It is likely that the population in the Canadian Arctic required even longer sections of coastline for their support.

Aside from seasonal nomadism there were long-term changes in Inuit distribution. The limits of the territory normally used in one season or another for the procurement of meat and other products shifted through the years, as did the location of many settlements. Alterations of climate, ice conditions, and the numbers and distribution of wildlife may have brought about slow migrations of Inuit population to more favourable regions; the overhunting of certain species, such as the musk-oxen, may have provided additional motivation to move, and the attraction of European vessels, trading posts and missions often constituted a further inducement to alter long-standing patterns of residence. Because of these influences we cannot expect to discover one distinct Inuit domain, with immutable boundaries, persisting through the entire 19th century. Rather, we may hope to identify a broad region used in one period or another for residence, travel and hunting.

The geographical extent of Inuit occupancy in the 19th century can be gauged by: (a) the distribution of identified group territories and settlements; (b) the location of travel routes connecting occupied regions; and (c) the limits of Inuit familiarity with the land.

Group Territories and Settlements

Henry Rink's two-part study of Inuit "tribes" was published in 1887 and 1891. He examined variations in the culture and language of known Inuit groups in order to locate the hearth region of Inuit origins, the "culture home". To delineate the total expanse of territory occupied by the Inuit was not his objective, but he nevertheless described briefly what he considered to be the accepted notion of the Inuit domain:

> . . . it comprises the littoral and islands of America north of a line extending from east to west and varying from 56° to 60° N. latitude, including Greenland and a portion of the northeast corner of Siberia.

A sketch map accompanying the first volume of Rink's study in 1887 showed more clearly than this vague statement the distribution of the Inuit territories. The map has two noteworthy features (Map 68). First, no section of coast, either mainland or island, appears unoccupied between Greenland and Alaska, other than southern Hudson Bay. Second, the zone of Inuit occupancy throughout the Arctic extends inland a uniform distance of approximately 50 miles, with no settlement beyond this slender coastal fringe. To what extent the map is based upon recorded observation is uncertain for no sources are stated. While it succeeds in showing the impressive east-west extent of the Inuit ecumene from Greenland and Labrador to Siberia and the Aleutian Islands, it gives an erroneous impression of spatial continuity and overlooks the utilization of inland regions.

The field investigations of Franz Boas on Baffin Island in 1882–1883 and subsequent researches into the historical record led to a substantial modification of Rink's picture of Inuit distribution. In 1888 Boas was able to describe the basic geographical characteristics of Inuit existence over a large portion of northern Canada. On a map entitled "The Eskimo Tribes of Northeast America" he delineated the territories occupied by "tribes" from Baffin Island to Coronation Gulf, showing the location of a number of seasonal settlements. Each "tribal" region represented the full extent of territory through which the individuals of the "tribe" normally moved in the search for food, during the yearly cycle. The sum of these territories may therefore be taken as the

total expanse of land occupied by the Central Inuit (those between Greenland and the Mackenzie River), as far as he was able to determine.

Before turning to a consideration of the distribution of the occupied area we should recognize that the map of Boas is not uniform in thoroughness and accuracy. His knowledge was most reliable for southeastern Baffin Island from Cumberland Sound to Clyde Inlet, a region in which he plotted seasonal settlements from his own observation and from information obtained carefully from Inuit informants. His knowledge was least dependable in areas remote from his own travels and from those of his Baffin Island informants, namely the coasts of Coronation Gulf, Queen Maud Gulf, Devon and Ellesmere islands, and the Labrador Peninsula, in which areas he portrayed Inuit distribution over simply by means of a narrow coastal strip. Northwestern Hudson Bay and Melville Peninsula were also beyond the limits of his observation but he was able to rely upon the published narratives of Parry, Lyon, Hall, Schwatka and Klutschak, whose collective experience in the region was considerable.

The map of Boas (Map 69) depicts in broad outline the Inuit ecumene, extending from Davis Strait westward to Coronation Gulf, and from Hudson Bay and the Hudson Strait region northward as far as the southwest coast of Ellesmere Island. Boothia Peninsula is represented as the northwestern limit of the settled area, with the islands north of Melville Sound (at least those known to exist at the time) shown as unoccupied.

Within this immense area of Inuit residence certain tracts were depicted as uninhabited. These include several glaciated mountain regions along the east coast of Baffin Island, and a few areas of low elevation and relief on western Baffin Island and in the Barren Grounds west of Hudson Bay, which may indeed have been deficient in game resources or otherwise unsuited to habitation. Other areas shown on Boas' map as unpopulated may have been occupied in fact, including the areas inland respectively from the coastal zones of occupancy west of King William Island, the south coast of Southampton Island, and around the Labrador Peninsula.

The cartographic and textual outline by Boas provided the basis of several subsequent attempts to delineate the territory occupied by the Inuit. In 1904 William Thalbitzer published a monograph analysing phonetical characteristics of the Eskimo language, in which he included a map showing the "present" and "earlier" distribution of the people from eastern Siberia to Greenland. For several reasons we cannot know precisely what periods of settlement are meant by these somewhat vague terms, but let us assume that Thalbitzer's "present territory of the Eskimo" (based on explorer-Inuit encounters) approximates the 19th century situation, and that his "earlier territory" (based on abandoned houses, tent rings, cairns, graves and implements) represents culture periods prior to the 19th century. The pre-19th century distribution of the Inuit is not of concern here, and in any case the pattern of early occupancy shown by Thalbitzer has been substantially altered by subsequent archeological investigations throughout the Canadian Arctic. But what does the map show of the 19th century Inuit domain?

In the regions covered earlier by Boas, Thalbitzer's less detailed map (Map 70) omits several of the unoccupied areas in the mountainous rim of Baffin Island, probably because of the necessity for cartographic generalization. It reduces the settlement zone of south Victoria Island but shows Inuit inhabiting the opposite mainland coast bordering Bathurst Inlet and Coronation Gulf (which Boas had indicated as uninhabited), and it reveals that from Eskimo Point, which, on the Boas map, is the southern limit of Inuit occupancy in western Hudson Bay, the zone of settlement continues farther south, narrowing progressively towards Churchill. These additions to the geographical range of the Inuit represented new ethnographic knowledge in the two decades following the investigations of Boas, rather than any expansion of the Inuit ecumene.

Beyond the parts of the Northwest Territories covered earlier by Boas, Thalbitzer's map shows Inuit settlement on western Victoria Island and along the mainland coast from Cape Parry westward through the Mackenzie Delta into Alaska.

In 1917 Inuit distribution was represented by H. P. Steensby in a publication examining the origin of Inuit culture. Like Thalbitzer a dozen years earlier he covered the entire realm of Inuit occupancy from Siberia to Greenland and from Ellesmere Island to Newfoundland, differentiating again between "present" and "earlier" periods. The pattern of "present" distribution (Map 71) closely resembles that of Thalbitzer, but there are a few notable differences. First, the settled zone in the central Arctic reaches much farther south into the Barren Grounds. Whereas Thalbitzer had indicated only a thin coastal settlement zone between Adelaide Peninsula and the Coppermine River, Steensby's map shows occupied territory extending as far south as a line from the lower Coppermine River through Dubawnt Lake toward Eskimo Point on the Hudson Bay coast. Within this large region, however, there are two unoccupied areas, one directly south of Queen Maud Gulf and the other between Baker Lake and the Back River. A second difference is in representing the settled zone on Victoria Island as continuous from the vicinity of Cambridge to Prince of Wales Strait.

In 1918 Wissler compiled a map entitled "The Distribution of the Eskimo", which was based largely upon the work of Thalbitzer and Steensby. The map avoids the troublesome distinction between "present" and "earlier" settlement; one symbol represents the "total extent of territory occupied by the Eskimo since their appearance on the Arctic coast", but in other respects the map adds nothing to the earlier efforts.

Wissler's map was later incorporated into Weyer's book, *The Eskimos* (1932).

Settlements

Boas plotted winter, spring, summer and fall settlements for southeast Baffin Island, a degree of precision that he was unable to extend into other parts of the Central Inuit territory, and that subsequent writers prudently avoided. The maps of Thalbitzer, Wissler and Weyer show a number of settlements but without indicating the principal season of occupation. Cartographically, the superimposition of symbols for specific sites upon those representing broad areas of occupancy has usually resulted in a lack of clarity, and for this reason Inuit settlements are shown by themselves in this paper, combining the information of the several sources already mentioned (Map 72). The settlements fall within the zones of occupancy already depicted on Maps 68, 69, 70, 71, and therefore add little to the general picture of Inuit distribution.

Travel Routes

Although cultural differences tended to maintain spatial separation between the larger, "tribal" groupings, and hostility created boundaries between others, intercourse among neighbouring groups was a normal, though periodic, phenomenon.

The most powerful incentive to undertake long journeys was undoubtedly trade. When certain people had access to resources that were lacking in other localities a basis for barter was established. Wood, soapstone and native copper were much sought after. In addition to these materials, widely used in the manufacture of a variety of traditional implements, inter-group trade included items of foreign make, such as knives, needles, tobacco, and so on. In regions where trading posts existed, or where whaling and trading vessels customarily wintered, imported goods regularly made their way into native society, with some of such items transported through native trade networks to remote regions far from their points of importation.

The occurrence of resources and the presence of European trade outlets attracted distant Inuit. In addition, some journeys were undertaken for other reasons including marriage, adoption of children, visits to relatives, and the desire to exploit rich or new hunting territories. The journeys rarely followed a strict itinerary. If the arrival of summer and the disappearance of snow cover interrupted sled travel, the travelling family or band might linger in that region for several months before continuing during the next winter. Jenness remarked that when Copper Inuit travelled inland to the Baker Lake region (a voyage of about 500 miles) they sometimes remained among the people there for a year or two and then travelled on to Chesterfield Inlet (another 200 miles distant) to trade with white men.

Many of the journeys were undertaken for social purposes, and trade occurred along regular, well-known routes: as Boas wrote, "these routes are established by tradition and the Eskimo never stray from them". The network of recorded travel routes among the Central Inuit totals approximately 11,000 miles, of which 8,000 miles were sled routes and the remainder routes for foot journeys or coastal boat travel.

The main components of the communication system mapped by Boas were:
(a) a route eastward along the north shore of Hudson Strait, which continued northward along the Baffin Island coast to Pond Inlet, Devon Island, and Ellesmere Island;
(b) several routes across Baffin Island to Foxe Basin;
(c) a few routes to summer hunting grounds around Piling, Nettilling Lake and Amadjuak Lake;
(d) a route southward from Igloolik along the coast of Foxe Basin and Roes Welcome Sound to Marble Island;
(e) a connection between Repulse Bay and the region of Boothia Peninsula and King William Island;
(f) a trade route ascending the Back River from King William Island and extending south to Baker Lake.

This communication network shown by Boas (1888) was adopted by Thalbitzer (1904), with the addition of a migration route from Jones Sound to northwest Greenland. Steensby (1917) produced a generalized synthesis, which omitted some of the shorter connections but extended the principal routes in several areas, namely:
(a) farther south along the east and west coasts of Hudson Bay;
(b) along the south shore of Hudson Strait and down the Labrador coast;
(c) between Devon Island and Boothia Peninsula;
(d) from Devon Island westward through Barrow Strait; Melville Sound and Prince of Wales Strait.

The Inuit routes shown by these several writers, when assembled (Map 73), total approximately 18,000 miles in length. However, some of these routes coincide with the "earlier" phase of occupancy depicted by Thalbitzer (Map 70). After subtracting these particular areas, the 19th century Inuit territory was nevertheless served by approximately 16,000 miles of travel routes.

Impressive as this figure may be, it is probably an understatement, owing to the difficulties mentioned earlier in obtaining accurate and complete information on the geographical aspects of Inuit life. Subsequent authorities have, in fact, added to the picture. Jenness, for example, stated in 1922 that the natives of western Victoria Island communicated with other groups by three distinct routes, not merely by the one route shown earlier by Stefansson for the Copper Inuit.

Similarly, in the important connection between the central mainland coast and the Baker Lake region, where Boas had indicated a sled route ascending the Back River and Stefansson had shown one striking south from Ogden Bay, Jenness added a third, beginning in Bathurst Inlet, which he considered to be the principal route inland.

Despite inaccuracies and incompleteness, the network of travel routes depicted by several anthropologists and geographers between 1888 and 1917 serves to indicate the basic pattern of Inuit communication. For our purposes these travel routes constitute an additional dimension of Inuit occupancy and land use, for they were not simply parallel sled tracks over the snow-covered tundra or the ephemeral wakes of umiaks or whaleboats in coastal waters. Each travel route was in reality a corridor of resource utilization and temporary residence, for long trips were not accomplished overnight, and food had to be secured along the way. Whatever width we might arbitrarily ascribe to these corridors of travel and hunting the important point is that they did have an areal, and not simply a linear dimension, and that these slender regions, connecting settlements and societies provided the resources necessary for the meaningful conduct and perpetuation of Inuit life over considerably larger areas.

Extent of Geographical Knowledge

Inuit were familiar with a wide expanse of territory. Not only did they travel extensively in search of animal food during the various seasons, but for effective navigation and successful hunting, they had to be aware of the topographic features and biological characteristics of the regions through which they travelled. Explorers were astonished at their facility for drawing detailed maps covering large areas, little realizing the degree to which lengthy travels and an intimate knowledge of the country were essential ingredients of human existence in a harsh environment. Their familiarity with the environment was recognized by Boas, who declared, "they have a very clear conception of all the countries they have seen or heard of", and he described how, in preparation for a voyage to an unfamiliar area, a man would be tutored by others, using a map drawn in the snow.

In southeast Baffin Island whalemen regularly encountered Inuit after 1839, and soon came to realize that the territory covered by them in their seasonal hunting and for trade and social reasons was impressively large. A young man at Durban Island delineated with considerable accuracy the complicated coastline of Cumberland Sound, more than 100 miles distant. Two decades later, when the explorer Hall met Inuit groups between Cumberland Sound and Frobisher Bay, the extent of their geographical knowledge was again effectively demonstrated when they drew him a map showing in detail the full extent of Frobisher Bay (whose length is about 150 miles). Some spoke of having travelled overland to Cumberland Sound, and even to Foxe Basin, and on at least three occasions Inuit arrived from the southwestern extremity of Baffin Island, approximately 400 miles distant. One of these visitors carefully outlined on paper most of the south coast of Baffin Island.

In other parts of the Arctic the experience was similar. The explorers, often finding themselves in regions where the authoritative, solid lines of their Admiralty charts became broken and vague, and finally ceased altogether, were understandably anxious to obtain some knowledge of the distribution of land and sea. From the time of Parry's second expedition (1821–1823) explorers frequently appealed to local Inuit, who with words, gestures and maps were able to describe, in some detail, the basic geographical features of large areas. As Inuit maps are described and analyzed elsewhere in this volume, it will be sufficient here to draw attention to a few selected maps produced in the 19th century, in order to indicate the spatial extent of individual experiences over broad areas.

The maps drawn by Inuit for explorers and whalemen were generally meant to delineate the coastline in localities where the outsiders had special interests or objectives and where the official maps and charts of the day were inaccurate or incomplete. The regions depicted varied greatly in size, from smaller (though not inconsequential) features such as Nettilling Lake or King William Island, to more extensive areas or tracts, such as Melville Peninsula or the west coast of Hudson Bay. Although the white men rarely attempted to obtain maps that illustrated the full extent of the Inuit cartographer's known world, a number of the maps collected during the 19th century cover very large territories (Map 74). Such maps may, in fact, represent the totality of the individual's familiarity with the land, and ofttimes they are of impressive dimensions. The region outlined by Itu for Boas in 1882–1883 (E on Map 74) is approximately 400 miles in diameter and reasonably accurate throughout Cumberland Sound, itself a region exceeding 100 miles in length. The area sketched for Hall in 1864 by Koojesse (B on Map 74), comprising all the north coast of Hudson Strait and Frobisher Bay, has an east-west dimension of at least 400 miles. In 1822 Parry and Lyon obtained several maps at Winter Island, in Foxe Basin. One, by Ewerat, represents all of Melville Peninsula, which is about 300 miles in length, from north to south. Another, by a woman, Iligliuk, delineates the coastline from Wager Bay north to Pond Inlet, a distance of over 600 miles. But the most astonishing map of all is that of Armou, drawn at Repulse Bay for Hall in 1866 (D on Map 74). It covers a north-south strip extending from Lancaster Sound to Churchill, approximately 1,100 miles in straight line length. According to Hall's report this document was "a chart of the waters and lands he had voyaged and travelled over in his lifetime".

Conclusion

Relying principally upon published narratives of explorers to document the Inuit presence in various localities, a number of scholars have attempted to reconstruct in broad outline the geographical extent of Eskimo territory in the 19th century, prior to the establishment of an extensive system of Arctic trading posts and the entry of other agents of economic and social change.

Between 1887 and 1918 several noteworthy maps of the entire Inuit ecumene were compiled, building one upon the other and incorporating new information. The map of Steensby, although small and general, was the culmination of this process, and has been subsequently adopted by some writers, along with aspects of the more detailed and comprehensive map of Thalbitzer. In my estimation, however, Steensby's portrayal of the Inuit domain could be improved. This task has been attempted in this essay, by means of careful comparison of the several maps of Inuit territory discussed above with patterns of travel routes shown by Boas and Thalbitzer and with specific areas mapped by individual Inuit during the 19th century. This approach is represented by Map 75, which was compiled in the following manner.

On considering the four maps of Inuit territory discussed in this paper, the earliest, that of Rink, was discarded because it is speculative, technically poor, and inaccurate. The other three were transferred to maps of a common scale (Maps 69, 70, 71). These were superimposed, and the maximum extent of the occupied territory was plotted. The resultant map was then superimposed upon Map 73 (travel routes), and corridors were added wherever the routes traversed what had formerly been identified as uninhabited space. The collection of 19th century Inuit maps presented by Spink and Moodie (1972) was examined to see whether any of the remaining empty areas were in fact well known to Inuit, and finally an offshore fringe of uniform width was added to the occupied regions to represent the zone of Inuit boat travel, sea mammal hunting, and occasional winter residence.

The resultant map shows an Inuit ecumene slightly larger than hitherto delineated. It cannot pretend to be a highly accurate representation because of the limitations of the original data, the incompleteness and distortion of the early base maps of northern Canada, and the difficulties of adapting maps of varying size and detail to a uniform scale. Nevertheless, this combination of several existing maps portraying different aspects of Inuit occupancy appears to produce a reasonable picture of the territory inhabited, exploited, and traversed by the Inuit of Canada during the 19th century.

References

Boas, Franz
1888 The Central Eskimo. *Bureau of American Ethnology, Sixth Annual Report, 1884–85*. Washington. Pp. 409–699. (Reprinted by University of Nebraska Press, 1961.)

Hall, Charles Francis
1864 *Life with the Esquimaux*. 2 vols. Sampson Low Son, and Marston, London. (Reprinted in one volume in 1970 by Charles E. Tuttle.)
1879 *Narrative of the Second Arctic Expedition made by Charles F. Hall . . . 1864–69*. J. E. Nourse (editor). Government Printing Office, Washington.

Jenness, Diamond
1922 The life of the Copper Eskimo. *Report of the Canadian Arctic Expedition 1913–18*, XII.Ottawa.

Parry, William Edward
1824 *Journal of a second voyage for the discovery of a Northwest Passage . . . in the years 1821–22–23*. John Murray, London.

Rink, H.
1887–1891 The Eskimo tribes. Their distribution and characteristics, especially in regard to language. 2 vols. *Meddelelser om Gronland,* 11: 1–163, and Supplement: 1–124.

Spink, John and D. W. Moodie
1972 Eskimo maps from the Canadian Eastern Arctic. *Cartographica,* Monograph, no. 5.

Steensby, H. P.
1917 An anthropological study of the origin of the Eskimo culture. *Meddelelser om Gronland,* 53 (2): 39–228.

Stefansson, V.
1914 Prehistoric and present commerce among the arctic coast Eskimo. *Geological Survey, Museum Bulletin,* no. 6. Anthropological Series, no. 3. Ottawa.

Thalbitzer, William
1904 A phonetical study of the Eskimo language. *Meddelelser om Gronland,* 31: 1–406.

Weyer, Edward Moffat
1932 *The Eskimos. Their environment and folkways.* Yale University Press, New Haven. (Reprinted in 1969 by Archon Books.)

Wissler, Clark
1918 Archeology of the Polar Eskimo. *Anthropological Papers of the American Museum of Natural History*, 22 (3).

Map 67
Place names referred to in the text

Map 68
Eskimo distribution (after Rink)

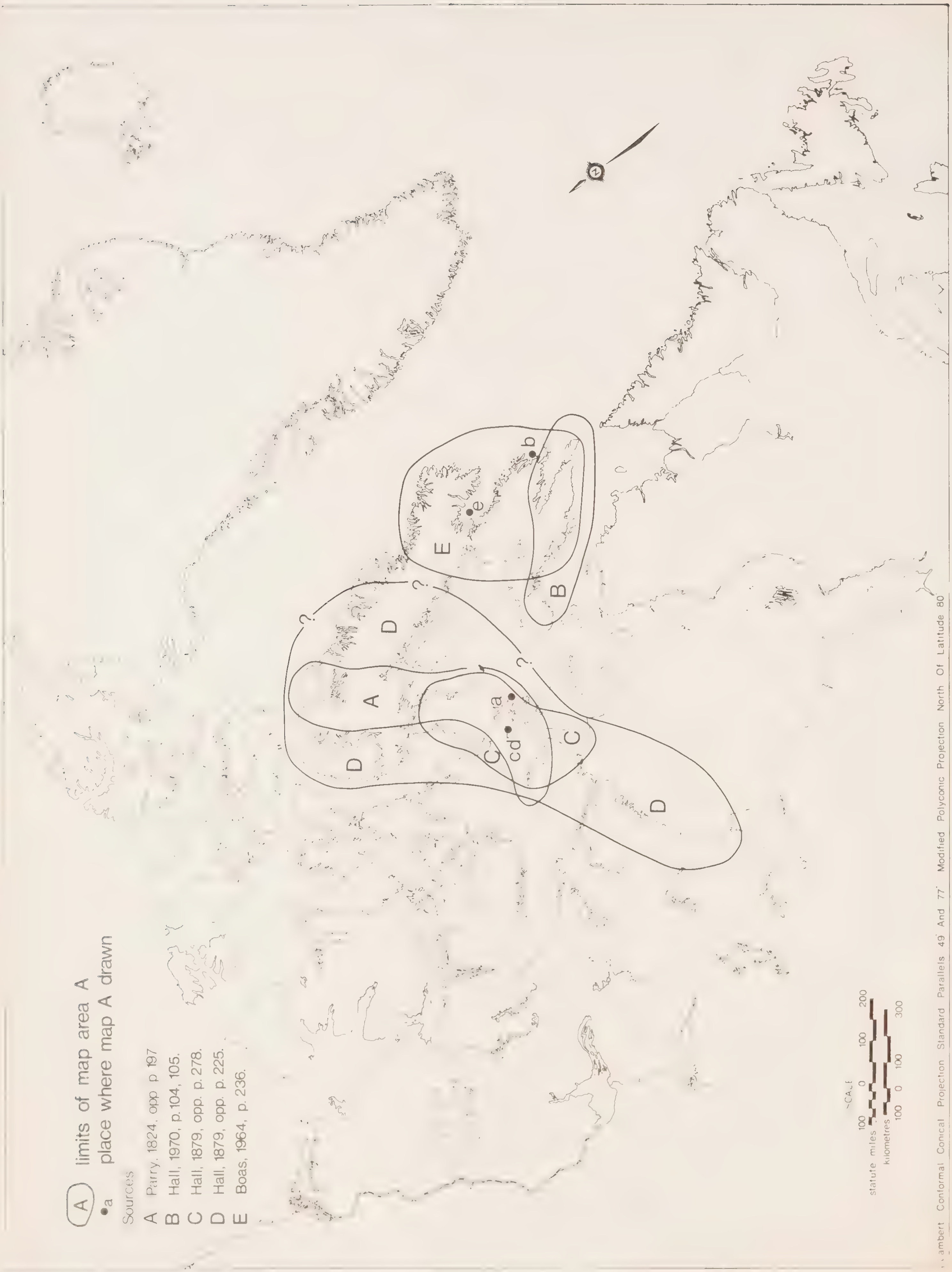
Map 69
Eskimo distribution (after Boas)

Map 70
Eskimo distribution (after Thalbitzer)

Map 71
Eskimo distribution (after Steensby)

Map 72
Eskimo settlements


routes (after Boas, 1888, plates 2, 3; Stefansson, 1914, end map).
earlier migration routes (after Thalbitzer, 1904, end map; Steensby, 1917, following p. 228; Stefansson, 1914, end map).
SCALE
statute miles 100 0 100 200
kilometres 100 0 100 300
Lambert Conformal Conical Projection. Standard Parallels 49° And 77°: Modified Polyconic Projection North Of Latitude 80


A limits of map area A
•a place where map A drawn
Sources
A Parry, 1824, opp. p 197
B Hall, 1970, p.104, 105.
C Hall, 1879, opp. p.278.
D Hall, 1879, opp. p. 225.
E Boas, 1964, p. 236.
statute miles 100 0 100 200
kilometres 100 0 100 300
Lambert Conformal Conical Projection Standard Parallels 49 And 77 Modified Polyconic Projection North Of Latitude 80
A
B
C
D
E
a
b
cd
e

Map 75
Eskimo distribution in the 19th century

The Nineteenth Century Mackenzie Delta Inuit*

by Robert McGhee**

Introduction

Before the arrival of Europeans in the 19th century, the people who are now called Mackenzie Eskimos inhabited the western Canadian Arctic coast between Barter Island and Cape Bathurst (Map 76). They were numerous people with a population variously estimated between 2,000 and 4,000, a figure larger than the total remainder of the Eskimo population inhabiting the Arctic regions between Mackenzie River and Hudson Bay. Despite the large size of this group, very little is known of the history and aboriginal culture of the Mackenzie Eskimos. This is primarily a result of the early extinction of local aboriginal culture due to a series of epidemic diseases which swept through the population during the late 19th and early 20th centuries. By 1910, the Mackenzie Eskimos were reduced to a few score survivors scattered among the more numerous Alaskan Eskimo immigrants who flooded into the Delta in the company of European whalers and traders.

Our sources for learning the history and culture of the Mackenzie Eskimos are now extremely limited: the memories of a few old-timers who recall late 19th century life; several casual descriptions by early explorers and traders; the works of Father Emile Petitot who apparently based his descriptions on a very superficial knowledge of the people; and the random ethnographic notes of Stefansson, Jenness, and Rasmussen, all made several years after the Alaskan Eskimo immigration and the subsequent changes in local culture. Archeological work was until recently limited to a few short surveys and random collecting by amateurs.

The Nineteenth Century in the Delta: The European Period

The first meeting between the Mackenzie Eskimos and Europeans occurred near the present settlement of Arctic Red River in the summer of 1799. The encounter was brief, resulting in the deaths of Mr. Livingstone of the Northwest Company, his interpreter James Sutherland, three Canadian voyageurs, two Indian canoemen, and five Eskimos. Ten years later, Mr. Clarke, again of the Northwest Company, reached the Delta proper, "but here a numerous part of Eskimaux occupying both banks of the river, put themselves in such a menacing attitude that it was deemed prudent to return without making any attempt either to land or to proceed further" (Wenzel 1823: 78–80).

The next contact occurred on July 7, 1826, when Sir John Richardson's small open boats, the *Dolphin* and *Union,* drifted down the last 30 miles of East Channel while the men traded with Eskimos who set off in kayaks from tent camps scattered along the river. By the time the party reached the shoals and islands at the mouth of the river, the flotilla had increased to some 40 kayaks and a few umiaks. After a brief skirmish occasioned by the grounding of the boats, the Eskimos pointed out a deep channel and the Europeans put out to sea on their way east toward the Coppermine River. Eskimos were again encountered in the vicinity of Point Atkinson and at Cape Bathurst, and a deserted winter village of 17 houses and a *kajigi* were examined at the former location (Franklin 1828: 203–217).

During the same week, Sir John Franklin descended West Channel to Shoalwater Bay with the other half of the expedition, where they were pillaged by Eskimos living on Tent Island. Continuing to the west, Franklin met a more friendly group of Eskimos at Shingle Point. They told Franklin that the Tent Islanders were hostile people who travelled from the eastern edge of the Delta each summer in order to fish (Franklin 1828: 100–120). Other parties of Eskimos were encountered at Herschel Island and beyond. When in 1837, the next Europeans, Dease and Simpson, entered the Delta it was the Tent Island people whom they met and with whom they traded (Simpson 1843: 109).

In 1840, the Hudson's Bay Company built Peel's River Post, later called Fort McPherson, near the head of the Delta but attracted no direct trade with the Eskimos for over a decade. The next direct contact occurred while several European parties were searching for the missing Franklin expedition. In 1848, Richardson (1851: 231–268) again travelled down East Channel on his way east to search for Franklin. Few signs were seen of Eskimos until the party was suddenly approached by a fleet of about 200 kayaks and three umiaks after having passed through the shoals at the mouth of East Channel and having rowed for one hour after leaving Point Encounter. Some trading took place. Small parties of Eskimos were again met along the coast of Tuktoyaktuk Peninsula and at Cape Bathurst. In 1850, two other search expeditions, those of Pullen (Hooper 1853: 347–355) and McClure (Armstrong 1857: 151–178), visited Eskimo settlements on Tuktoyaktuk Peninsula and Cape Bathurst seeking information about Franklin.

The second half of the 19th century was a period of rapid and massive change for the Mackenzie Eskimos, but only the vague outlines of this period are now known. European trade goods had trickled into the area by at least the late 18th century (Mackenzie 1970: 192), mainly through trade with North Alaskan Eskimos who had obtained Russian trade goods (Franklin 1828: 130), and after 1840, through trade with Kutchin Indians frequenting Peel's River Post. Direct trade with Europeans became more important after 1850. In

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June of that year, a party of Eskimos who had camped at Point Separation in order to trade with the Kutchin were fired at by the Indians who were accompanied by two Hudson's Bay Company employees from Peel's River Post; four Eskimos were killed (H.B.C. B. 157/z/1). The threat of being massacred by the Kutchin who were protecting their middleman position was probably the main factor which kept Eskimos from visiting the post of Peel River. Another possible reason may be deduced from the report given to McClure's men by Eskimos at Warren Point and Cape Bathurst in 1850; they did not visit the post because Indians trading there had been poisoned by "fire-water" (Armstrong 1857: 151, 177).

Nevertheless, the desire for trade goods soon overcame the fear of Indian guns and European fire-water, and in late 1852, the trader at Peel's River Post reported that "three Esquimaux of the Western Tribe visited me last summer (1852), they were of course well received, and from what I could understand they are to visit me again in the spring with furs" (H.B.C. B.200/b/29: 31). The following year, the trader reported that the Mackenzie River Eskimos visited the post, but brought nothing to trade and were given a few awls, needles, rings and glass beads (H.B.C. B.200/b/32: 29). Although there was no trouble between these Eskimos and the Indians camping at the post, the trader notes that on their way upstream, the Eskimos had pillaged a lone Kutchin of goods to the value of 20 "made beaver". In the summer of 1854, three large parties of Eskimos arrived at Peel's River Post bringing a few fox skins and some seal oil which they traded for ammunition and tobacco (H.B.C. B.200/b/32: 86). We do not know which tribes these parties represented.

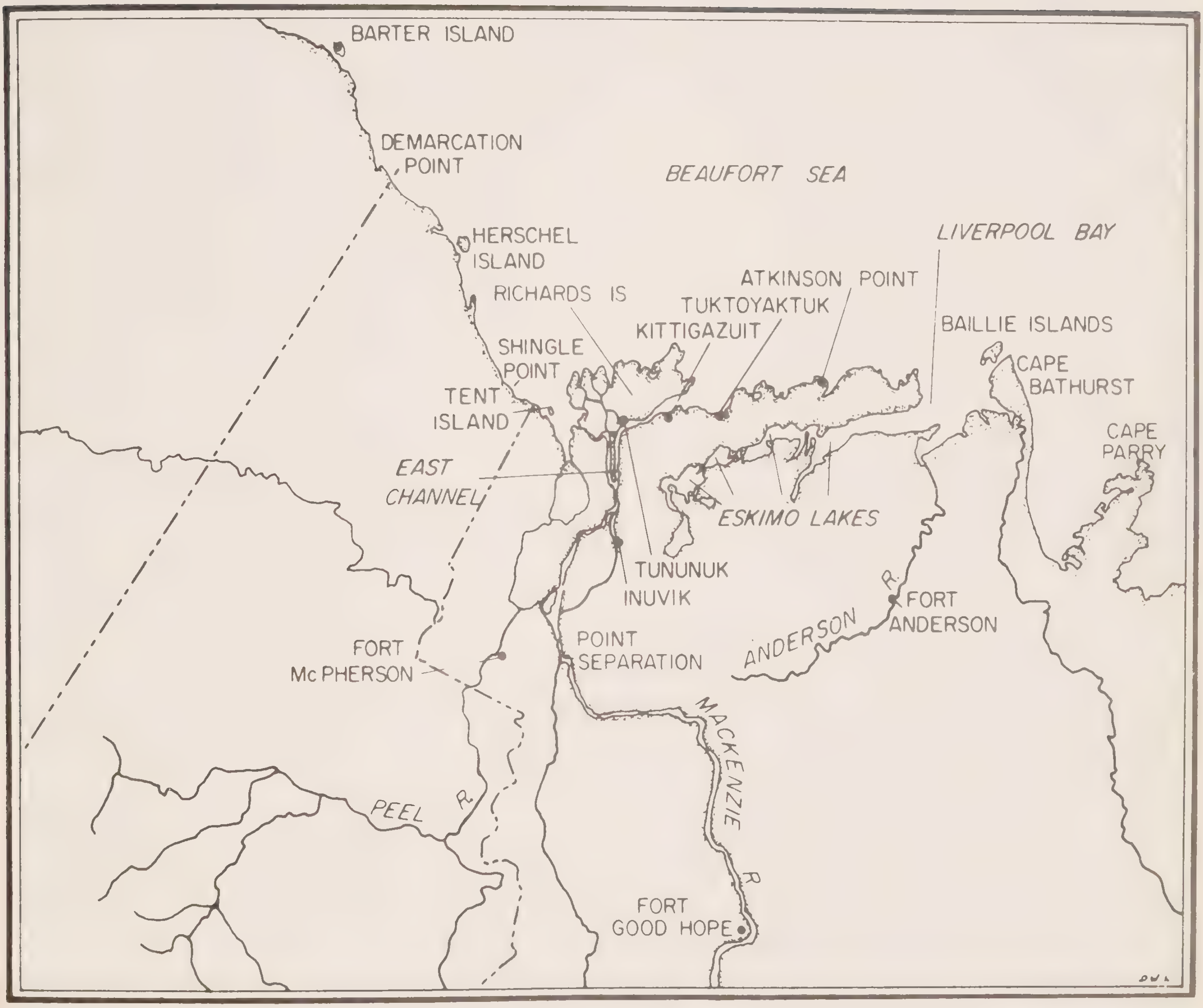
The following year 50 Eskimos visited the post, including seven from Cape Bathurst who brought musk-ox skins to trade (H.B.C. B.200/b/32: 137). The Cape Bathurst people were apparently at odds with the Mackenzie River Eskimos, and in 1856 they began to make approaches to Fort Good Hope by exchanging presents with the trader at that post (H.B.C. B.200/b/32: 162). Also in 1856, the instructions from the Chief Factor in Fort Simpson indicated that Eskimo trade was beginning to be of sufficient consequence to merit encouragement. The trader at Peel's River Post was (a) instructed to pay Eskimos at the same rates as Indians in order to discourage the activities of Indian middlemen; (b) authorized to take wolverine skins from other post returns in order to trade them to the Eskimos who found them a very desirable trade item; and (c) advised to persuade an Eskimo boy to remain at the post in order to learn English and serve as an interpreter. Metal sealing harpoons fashioned in the blacksmith shop at Fort Simpson were sent as trade items with a suggested price of two beavers. Instructions were given on the preparation of fox skins and seal oil for trade, an Eskimo vocabulary was sent, and finally the trader was warned that, "you cannot be too cautious in your dealings with the Esquimaux" (H.B.C. B.200/b/31: 54).

For the remainder of the decade, the Eskimo trade increased, and in 1859, the trader at Peel's River Post could report a trade worth of about £1,000. Relations between Eskimos and Europeans were now closer, and when two Eskimo men, a woman, and two children travelled to Fort Simpson with the fall boats one girl remained to spend the winter at the post. "Chief's coats" were sent to the two "chiefs of the Mackenzie River Esquimaux" but no other tribes are mentioned, suggesting that the trade at Peel's River Post was primarily with Mackenzie Delta Eskimos rather than with those of Herschel Island and Cape Bathurst (H.B.C. B.200/b/33). The following year, the trader reported that the chief of the Mackenzie River Eskimos requested a trading post at Point Separation or at another point close to their hunting grounds, again suggesting that the Eskimos visiting Peel River were from the Delta proper. Although 117 Eskimos visited the post that year, they brought few furs, and apparently hunted only enough to exchange for a winter's supply of tobacco, which had now taken the place of wolverines as the trade item most desired (H.B.C. B200/b/34).

Meanwhile, a new trade had developed between Fort Good Hope and the Cape Bathurst Eskimos. Between 1857 and 1860, Roderick McFarlane, the trader at Fort Good Hope, made several trips overland to Anderson River for trading purposes and in 1861, he build Fort Anderson on that river. A good account of the establishment of this post and of its five years of operation until its abandonment in 1866 due to low fur returns is given by Stager (1967). Although most of the trade at Fort Anderson was with Cape Bathurst Eskimos, Mackenzie River Eskimos and Western Eskimos are occasionally mentioned in the post records.

In the late 1860's, the nature of contact with Europeans changed as whaling ships began to appear along the coast. Although whalers did not move into the Mackenzie area in force until about 1890, as early as 1868 and again in 1869, the trader at Peel's River Post heard from parties of Western Eskimos of a ship wintering and trading off the coast (H.B.C. B.200/b/36). The aboriginal population structure began to change rapidly at about this time. After the abandonment of Fort Anderson, the Eskimos who had traded there travelled in large numbers to Peel's River; in 1866, Petitot reported seeing 250 Anderson River Eskimos at that post (Savoie 1971: 136). By the winter of 1869/1870, these two groups were wintering together and were plagued by misfortune according to the trader's report at Peel's River: "Another party came up at Christmas and report three murders and the death of many others from sickness among the Mackenzie River and Anderson bands, who are living together this winter and are said to have a good many furs among them, but will not be in until the days get long and warm. As neither party had met with success at the whale fisheries last summer, food was rather scarce with them. They were camped on the ice hunting seals – a few had started to visit the band on the

Map 76
Modern place names in the Mackenzie Delta area



Islands, and on the west of Mackenzie River, in search of food and furs, and will not likely return until shortly before open water" (H.B.C. B.200/b/38: 22).

An European introduced disease probably caused the sickness mentioned in the above report; disease was to be a constant plague to the Mackenzie Eskimos over the next few decades. The first epidemic mentioned in the records occurred in 1865 when scarlet fever attacked the Indian hunters at Fort Anderson and measles occurred among the Eskimos trading at that post (H.B.C. B.200/b/35: 94). Petitot (1887: 175, 183) mentions an influenza epidemic among the Mackenzie River Eskimos in 1868. In 1871, smallpox occurred at Peel's River Post and the Eskimo whale hunt failed for the second consecutive year (H.B.C. B.200/b/38). The murders referred to in the 1870 report were probably a result of the continuing feud reported to Stefansson (1919: 166, 378) and described by Nuligak (1966: 191–203), which may reflect the deterioration of relationships between the Kittegaryumiut and Kupugmiut, the two major bands of Mackenzie River Eskimos.

After the appearance of the American whaling fleet along the Mackenzie Delta coast in 1889, and with the increasing association between the indigenous population and the whalers wintering at Herschel Island and elsewhere, the effects of epidemic disease and the disruption of aboriginal social patterns accelerated rapidly. The population was subjected to two devastating measle epidemics in 1900 and 1902 (Jenness 1964: 14). By this time, according to police reports, the Mackenzie Eskimo population had declined rapidly from an estimated 2,500 people in 1850 to about 250 in 1905 and under 150 in 1910 (Usher 1971a: 175). At the same time as Eskimos were being decimated by disease, local aboriginal culture was being submerged beneath a wave of American and Alaskan Eskimo introductions. Shocked by the materially rewarding involvement with the American whaling ships, Mackenzie Eskimo culture was susceptible to wholesale adoption of the cultural traits of American-oriented Alaskan Eskimos. The latter were either brought to the area as caribou hunters by the whaling ships, or had moved in on their own in search of new hunting and trapping grounds after the North Alaskan caribou herds had been killed off to supply the excess demands of the whaling fleet. By 1907, Stefansson reported: "A large number of the Nunatama have come either overland by themselves or eastward from Point Barrow or Kotzebue Sound as passengers on whaling ships, while those from Bering Strait have ordinarily come as whalers or servants on board. The net result is that the Mackenzie population is becoming mixed in blood, is already deeply influenced in its culture, and has taken up many strange words into the spoken language" (Stefansson 1919: 195).

Aboriginal Mackenzie Eskimo culture could probably be considered to have become extinct between 1900 and 1910.

The Aboriginal Mackenzie Eskimo

The aboriginal mid-19th century population of the Mackenzie Eskimos has been variously estimated from 2,000 (Petitot 1876: 2) to over 4,000 (Stefansson 1913: 452). Usher (1971a: 171) has recently made a minimum estimate of 2,500, based on the number of people encountered by various explorers throughout the Mackenzie coastal area. This total population was divided into several major territorial groups who had different economic adaptations according to region, and who appear to have been more or less culturally distinct. The small amount of information which we have on the number of territorial groups that existed and how they related to one another is confusing and contradictory.

In 1826, Richardson transcribed the name of the Eskimo group which he met along the lower course of East Channel as "Kitte-garroe-oot" (Franklin 1828: 203). The people met by Franklin on the same day at Tent Island were said to have come from the eastern edge of the Delta, and to have their faces tattooed in the same manner as the people of East Channel; they probably belonged to the same or a closely related territorial group (Franklin 1828: 120). On the other hand, the people whom Franklin met at Shingle Point just to the west of Tent Island, and along the coast westward to beyond Herschel Island, thought of themselves as a separate group from the Tent Islanders.

In 1852, the Point Barrow Eskimos told John Simpson of their trade with the Mackenzie people at Barter Island: ". . . thus the people they trade with at Barter Point are called Kang-ma-li-en-gu-in, whose winter huts are probably at Demarcation Point: among them they have occasionally seen a few Ko-pang-meun, Great River (Mackenzie) people, whom they distinguish by having a tattooed band across the face. Beyond the Mackenzie is a country called Kit-te-ga-ru, and farther still, but very distant, one inhabited by the people who make the stone lamps before spoken of" (Simpson 1875: 269). The name "Kang-ma-li", which appears in various transcriptions but most commonly as "Kogmollik", became generally applied to the Mackenzie Eskimos during the whaling period. It is an Alaskan Eskimo generic term for people living eastward along the coast, and was not a name applied to any one territorial group (Stefansson 1919: 23). The people described to Simpson as "Kang-ma-li" were probably the Eskimos met by Franklin between Shingle Point and Herschel Island. The "Ko-pang-meun" may have been the people whom Franklin met at Tent Island and who were said to come from the eastern edge of the Delta. The "country of Kit-te-ga-ru" probably refers to the East Channel people met by Richardson, while the lamp-making people are obviously the Copper Eskimo of the Coronation Gulf region, whose soapstone lamps were traded westward to the North Alaskan Eskimos.

In the records of the mid-19th century Hudson's Bay Company traders, four "tribes" are consistently mentioned from the Mackenzie area: Western Eskimos, Mackenzie River Eskimos, Cape Bathurst Eskimos and Anderson River Eskimos. The Western Eskimos, who came to Peel's River Post for the first time in 1852 (H.B.C. B.200/b/29: 131) and who traded with the Rat Indians (Vunta Kutchin) at Barter Island (Collinson 1875: 144), were probably the group met by Franklin between Shingle Point and Barter Island. The Mackenzie River Eskimos, who made up the majority of Eskimos trading at Peel's River Post during the early period, may have comprised the "Ko-pang-meun" of Simpson and the "Kitte-garroe-oot" of Richardson. The Cape Bathurst and Anderson River groups obviously refer to people living east of Liverpool Bay.

In the 1860's Petitot (1876: 3) claimed that the "Tchiglit" a mysterious name which he applied to the Mackenzie Eskimos generally, were divided into three groups: "Tareormeut" from Herschel Island to Liverpool Bay including the mouths of the Mackenzie River; "Kramalit" or Anderson River people; and "Kragmaliveit" or Cape Bathurst people. Petitot probably learned these names from Mackenzie River Eskimos whom he met at Peel's River Post, for these people later used the name "Tuyormiut" for Herschel Island Eskimos and the familiar "Kagmalit" for people living to the east (Stefansson 1919: 23). Petitot probably knew none of the actual territorial group names of the Mackenzie Eskimos.

The most complete description of Mackenzie Eskimo territorial groups can be compiled from the notes of Stefansson which are based on random pieces of information collected after the aboriginal groupings had broken down. Stefansson (1913, 1919) mentions five distinctly named groups: Kigirktarugmiut from the western edge of the Delta to Demarcation Point or Barter Island; Kupugmiut and Kittegaryumiut in the Delta area centered around the mouth of East Channel; Nuvorugmiut along the Tuktoyaktuk Peninsula centered at Point Atkinson; and Avvagmiut of Cape Bathurst and the adjacent Baillie Islands (see Map 77). Each group was named after a central village or locality: Kigirktayuk on Herschel Island, Kupuk and Kittigaruit on either side of the mouth of East Channel, Nuvurak on Atkinson Point, and Avvak at Cape Bathurst. Stefansson's account seems to be the most consistent with the other sources available and is probably essentially correct.

Usher (1971a: 169) divides the aboriginal Mackenzie Eskimo population into five groups which differ slightly from those of Stefansson: (a) a group of 200 to 300 persons living between Shingle Point and Barter Island; (b) a group of about 1,000 centered at Kittigazuit but occupying the outer fringes of the Delta and the southern Eskimo Lakes; (c) a group of 200 to 300 along the Tuktoyaktuk Peninsula between Toker Point and Cape Dalhousie; (d) a group of 500 in the Anderson River valley and Liverpool Bay; (e) another group of about 500 inhabiting Cape Bathurst. The probability that the latter two groups were one and the same is proposed below, and in view of this, it may be wise to reduce Usher's minimum population estimate from 2,500 to 2,000, a figure which is identical with Petitot's original estimate.

Because Stefansson's notes seem to be the most reliable in terms of being consistent with other evidence, they will be used as the basis for reconstructing Mackenzie Eskimo territorial groups and attempting to define the cultural differences between the various groups.

The territorial groups will be identified by the names which they used for themselves during the whaling period. The locations of these groups are shown on Map 77.

● *Kigirktarugmiut:* During the early 20th century, this group took its name from the main village on Herschel Island. They were the "Western Eskimos" of the early traders, the Tareormeut of Petitot, and the people met by Franklin from Shingle Point to Herschel Island and beyond. They occupied the coastal area from Shingle Point westward to Demarcation Point or Icy Reef (Stefansson 1919: 155), and their territory probably extended aboriginally to Barter Island where they left the archeological remains excavated by Jenness (1914) and which are now in the collections of the National Museum of Man, Ottawa. During the whaling period, the group clustered around Herschel Island where several whaling ships wintered each year between 1889 and 1907. However, little is known of them, since they were the first to come into close contact with whalers and Alaskan Eskimos and, hence, were the group most immediately influenced by this contact.

In the mid-19th century, the Kigirktarugmiut traded for European goods with the Vunta Kutchin Indians and with both coastal and interior Eskimos of North Alaska, the major trading contacts occurring at Barter Island (Franklin 1828: 130; Collinson 1875: 144; Stefansson 1919: 186; Gubser 1965: 49). The North Alaskan Eskimos considered them to be hostile (Simpson 1875: 265), and the Kigirktarugmiut, in turn, were afraid of the Mackenzie Delta Eskimos to the east (Franklin 1828: 120). This hostility between two groups traditionally classified as Mackenzie Eskimos probably reflects a certain amount of cultural difference. Stefansson (1919: 381) stated that the aboriginal Herschel Island dialect was quite different from that of Kittigazuit and was closer to that of Point Barrow. The cruciform winter house built by the Eskimos of East Channel and the area east of the Delta has not been reported archeologically from the area west of the Delta, where the characteristic winter house was rectangular in outline with an entrance tunnel or sunken antechamber in the narrow end (Jenness 1914; Osborne 1952; MacNeish 1956).

Prior to gathering around the whaling settlement at Herschel Island, this group seems to have passed the winter in several coastal villages located at good sealing or fishing localities. Stefansson's (1919: 162, 166, 192) informant, nick-

named Roxy, stated that during his childhood spent along this coast before 1889, winter villages were located at Escape Reef, Shingle Point, Sabine Point, King Point, Roy Point, Stokes Point, Herschel Island Harbour, and Herschel Island sandspit. The size of these villages was denoted by the number of "whaling boats" or "whaling canoes" which they could muster; the village at Sabine Point is remembered to have had 12 boats while the village at King Point had six. These vessels were probably kayaks, which were used to hunt beluga, rather than umiaks which were used for hunting the bowhead whales whose appearance is rare along this coast. Their number, therefore, roughly represents the number of able men in each village and the population of each might be estimated at about 60 and 30 people, respectively. If these villages were of average size, the total population of all eight villages was probably close to Usher's estimate of 200 to 300 people, this figure being based on the number of people encountered by early explorers.

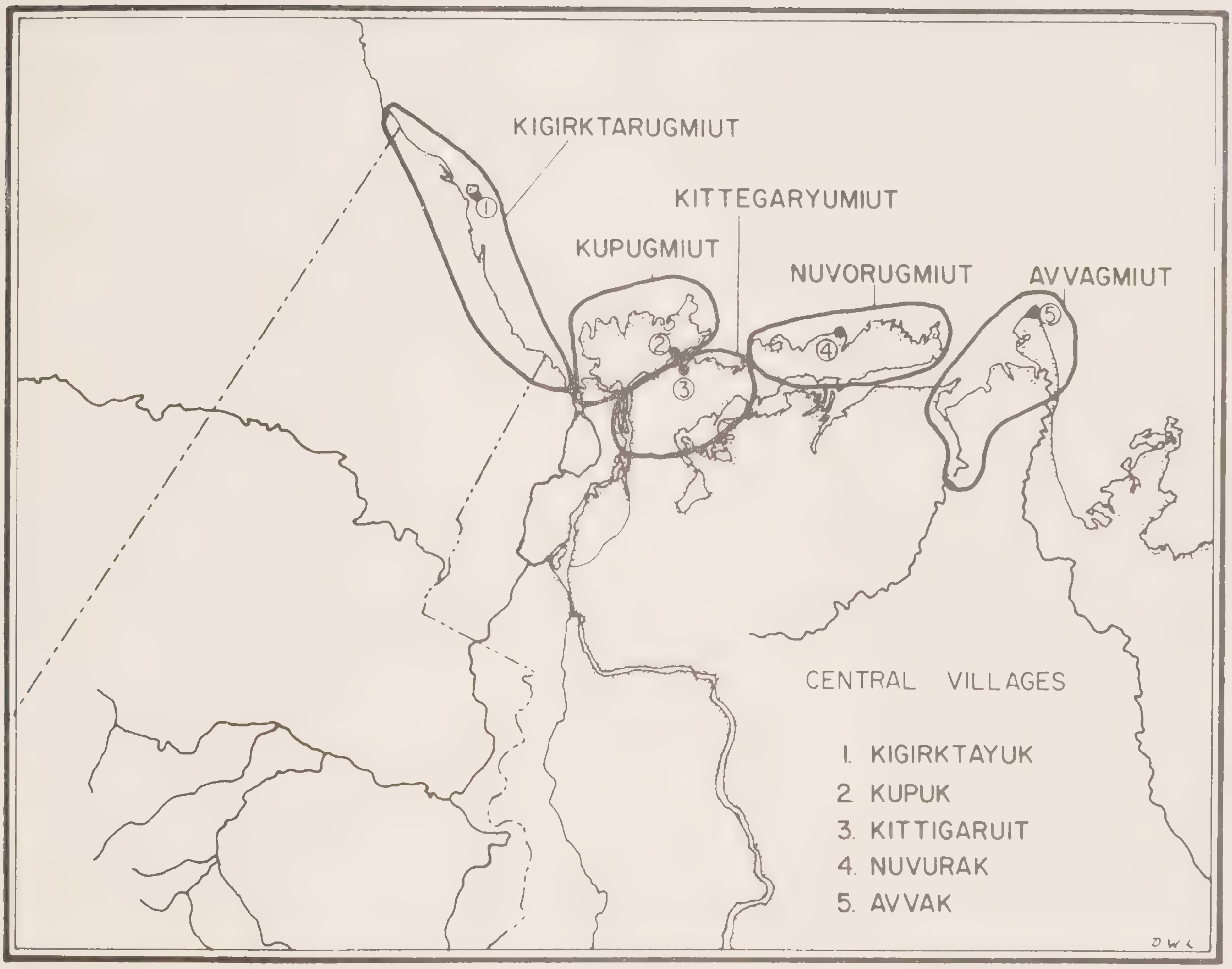
Little is known of the seasonal economic round followed by this group, but fish was probably the basis of subsistence. Stefansson (1923: 74–75) describes the method of setting gill nets both from kayaks and from shore with long poles which stretched the net 60 to 100 feet from shore. Using this technique, three or four men could net 1,500 to 3,000 pounds of herring per day during the September run, much of which was stored for winter use. Sealing was also important, at least during the post-contact period when the Herschel Islanders netted seals during the spring and fall (Stefansson 1919: 186). We do not know whether seal nets were used aboriginally, although it seems probable that they were; in any case, seals were probably hunted from kayaks and through breathing holes in winter ice. In addition, caribou approach close to the coast in this area, and caribou hunting could probably have been practised throughout the year. Because most resources are distributed rather evenly along this coast, we can suppose that this group led a rather sedentary life without the necessity of major seasonal movements in search of game. There is now evidence of seasonal concentrations of population, except during the summer trading at Barter Island; most of the year was probably spent in small camp groups of a few families each. Prior to the appearance of European trade goods and consequent changes in the aboriginal trading patterns, there was probably little contact between this group and those of the Delta area.

● *Kupugmiut:* This group took its name from the village of Kupuk (or variously transcribed as Kobuk, Goopuk, Kukpak, and others), located on the east coast of Richards Island facing Kittigazuit across six miles of water and shoals at the mouth of East Channel. The locality retains the name today and is marked by an archeological site visited by MacNeish (1956: 48). The name "Kupuk" also refers to the Mackenzie River, and some people who called themselves Kupugmiut may not have lived at the village of that name.

Although the Kupugmiut were mentioned to Simpson in 1852 and to Murdoch (1892: 45) in 1882, almost all of our scanty information comes from Stefansson's informant, Roxy, who was born at Kupuk during the 1860's or 1870's. According to him, Kupuk was a large village with more winter houses than Kittigaruit across the river. Hostile relations between the inhabitants of these two villages had existed until recently, yet the people of Kupuk and Kittigaruit were "all the same" (Stefansson 1919: 156, 166). A few days after making this statement, Roxy told Stefansson that Kupuk had been abandoned in the time of his great-grandfather and the people had moved to "Tsannirak", a village located one mile from Kittigaruit. Another of Stefansson's informants, a Kittegaryumiut named Ovayuak, lists "Tsaunrak" as a village inhabited during his youth and does not mention Kupuk (Stefansson 1919: 170, 180). In Petitot's (1887) map of the Mackenzie Delta area, the village "Tchenerark" appears in the present location of Kittigazuit, and it is noted that this village is the main summer station of the Mackenzie Eskimos for hunting beluga (Petitot 1887: 274). Petitot mentions neither Kupuk nor Kittigaruit in his writings on the Mackenzie Eskimo. Nuligak (1966: 191–203) gives a traditional account of a feud between the people of Kupuk and Kittigaruit which lasted through most of the latter half of the 19th century, but makes no mention of the mysterious "Tsannirak". I have found no knowledge of this place name among the present inhabitants of the region, and its location and significance remains a mystery.

From this rather confusing evidence, we may deduce that the "Mackenzie River Eskimos" of the early traders were divided into two groups calling themselves Kupugmiut and Kittegaryumiut, who were culturally similar and who had close personal relations combined with a feuding tradition. Although both groups probably converged at the mouth of East Channel for the summer beluga hunt, the territories which they occupied during the remainder of the year were probably distinct. Roxy (Stefansson 1919: 171) stated that the Kupugmiut hunted in the Anderson River region while the Kittegaryumiut hunted on Richards Island. This statement was probably reversed in transcription since it conflicts with the placement of the two groups on Stefansson's (1919) map, and since Kupuk is on Richards Island while Kittgaruit is on the eastern shore of East Channel closer to the Anderson River. It is more probable that the Kupugmiut had their summer fishing stations and winter house sites scattered along the coasts of Richards Island and along the outer fringes of the Delta as far west as Tent Island. If this is correct, the people whom Franklin met at Tent Island were probably Kupugmiut who came to the area to fish during the spring and returned to Kupuk for the summer whaling. We cannot estimate the size of the Kupugmiut population; Franklin (1828: 101) saw 250 to 300 people at Tent Island, and if these were Kupugmiut, we may surmise the total population of that group to

Map 77
Aboriginal groupings of the Mackenzie Eskimos



have been somewhat larger. We must assume that their seasonal economic round was similar to that of the Kittegaryumiut described below.

● *Kittegaryumiut:* This group, first mentioned by Richardson in 1826, took its name from the village which appears on modern maps as Kittigazuit, but the Eskimo name of which is probably closer to Kittigaruit. It was reported to be the largest village in the Mackenzie area (and probably in all of Arctic Canada) with a summer population of 800 to 1,000 people; the Kittegaryumiut were the most populous of the Mackenzie Eskimo territorial groups. The settlement was located at the mouth of East Channel where it served as a beluga hunting station during the summer and as a central location for winter visiting and ceremonial activities.

The territory occupied by the summer fishing stations, hunting grounds, and winter house locations of the Kittegaryumiut probably extended along East Channel as far east as Tuktoyaktuk, and southward to include the southwest section of the Eskimo Lakes. During the summer, the Mackenzie Delta Eskimos made some use of the forested area of the Delta as far south as the Narrows near the Arctic Red River, which was the traditional boundary between Eskimo and Kutchin Indian territory (Wenzel 1823: 78; Richardson 1851: 223). In July 1789, Mackenzie (1970: 197) found several abandoned Eskimo fishing camps to the north of the Narrows, but found winter houses only in the outer islands of the Delta. Also, it is traditionally claimed that these Eskimos made occasional boat trips up the Mackenzie River as far as the Ramparts near Fort Good Hope, some 200 miles upstream from the Narrows, in order to obtain slate from a quarry (Mackenzie 1970: 208; Richardson 1851: 213; Stefansson 1923: 12). Such expeditions must have occurred only rarely, and relations between the Mackenzie Delta Eskimos and the Kutchin to the south appear to have been guarded if not always hostile. The Kutchin met by Mackenzie near the Arctic Red River in 1879 were in frequent but wary contact with the Eskimos of the East Channel area, from whom they obtained shell ornaments, small amounts of iron which probably derived from the Russian forts in Alaska, and sinew-backed bows (Mackenzie 1970: 192, 208). A good deal of trade took place between these groups before 1852 when the Eskimos began to visit Peel's River Post, but several instances of fighting in connection with this trade have been noted above. Hooper (1853: 273) states that the Mackenzie River Eskimos (that is, the Kupugmiut and Kittegaryumiut) traded with the "Mackenzie River Loucheux" (probably the poorly-known Nakotcho Kutchin), but were at "war to the knife" with the Peel River Loucheux (the Vunta Kutchin or Rat Indians who had trade relations with the Kigirktarugmiut at Barter Island). After the Eskimos began to trade at Peel's River Post, there was some intermarriage with Indians, and at least one Vunta Kutchin lived at Kittigaruit during the late 19th century (Stefansson 1919: 276).

The relationship of the Kittegaryumiut to other Eskimo groups is not well known. Although intermarriage was common and population movement frequent between various Mackenzie Eskimo groups during the late 19th century (Nuligak 1966: 191), this may have been largely a result of new economic and trading patterns brought about by European influences. Early traders and explorers heard complaints about the hostility of the Kittegaryumiut and Kupugmiut from the Kigirktarugmiut of Shingle Point, the Nuvurugmiut of the Tuktoyaktuk Peninsula (Franklin 1828: 120, 213), and the Avvagmiut of Cape Bathurst (H.B.C. B.200/b/32: 136). These citations suggest that relations between these groups were not particularly close during the aboriginal period.

The seasonal round of the Kittegaryumiut can be generally described from the accounts of Stefansson (1919), Nuligak (1966), and from a few notes by others. Subsistence was based mainly on beluga and fish, although caribou and small game were also hunted. The communal beluga hunt, which brought together the largest concentration of population at Kittigaruit, took place from mid-July to early September. Beluga meat was dried and the blubber rendered to oil or stored in pits for fall and winter use. After the whaling season, the population dispersed to inland localities where caribou could be hunted from kayaks and to fishing stations in the East Channel and Eskimo Lakes regions. After hunting enough caribou to obtain skins for winter clothing, and accumulating supplies of fish (mainly herring, whitefish, and inconnu taken in gill nets), they moved into semi-subterranean winter houses in October or November. These houses, which were occupied by an average of six familes each, were scattered singly or in small groups among fishing localities along the lower river and sea coast. The supplies of fish, whale meat, and oil or blubber were hauled to the houses by sled during the early winter.

The dark days of December brought the season for ceremonial activities (*kaivitjvik*) for which many people again congregated at Kittigaruit. With the return of the sun in January, supplies of food and oil were usually running low, and sooner or later, most families began leaving their houses to visit more fortunate communities or to begin fishing through the ice with jigs and hooks. During this period, they built and lived in snow-houses on the river or sea ice. The hunting possibilities increased as the days grew longer and caribou, moose, rabbits, and perhaps a few seals were taken. In late May or early June, the break-up of river ice enabled people to travel into the Delta by kayak and umiak to fish, hunt waterfowls and land mammals, and probably to trade with the Indians. This season of mobility and dispersion continued until the beginning of the beluga hunting season in mid-July, when the population again congregated at Kittigaruit.

● *Nuvorugmiut:* Eastward from the mouth of East Channel stretches the Tuktoyaktuk Peninsula, a low and lake-filled strip of land, about 100 miles long and averaging 20 miles in width between the Eskimo Lakes to the south and the Beau-

fort Sea to the north. This was the territory of the Nuvorugmiut, whose largest settlement and population centre was at Nuvurak or Point Atkinson, a sandy point stretching into the Beaufort Sea about 75 miles east of Kittigaruit. Small parties of Eskimos were met along this coast during the summers of 1826 and 1848 by Richardson (Franklin 1828: 213; Richardson 1851: 245), and in 1850 by Pullen (Hooper 1853: 343) and McClure (Armstrong 1857: 151). On the basis of these accounts, Usher (1971a: 171) estimates the population at 200 to 300 people. This group is not mentioned by the Hudson's Bay Company traders, suggesting that they were not distinguished from the Mackenzie River or Cape Bathurst Eskimos.

Most of our information on this group is from Stefansson's informant Guninana, who was born at Nuvurak about 1880. According to her (Stefansson 1919: 349), and to a man whom Richardson (1851: 257) talked to at Nuvurak in 1848, the Nuvorugmiut based their subsistence on different resources and followed a different seasonal round than that of the Kittegaryumiut. The most important game pursued during the summer was caribou. They were speared from kayaks in the Eskimo Lakes or hunted with bow and arrow in the interior of the Tuktoyaktuk Peninsula. This area still provides excellent caribou grazing, and presently supports the only commercial reindeer herd in Canada. Fish were also netted during the summer, and parties went to sea in umiaks to hunt bowhead whales. Guninana did not remember a bowhead whale ever being captured, and so whaling was probably not an important subsistence activity. White whales were not hunted systematically, and people from Nuvurak rarely joined the beluga hunt at Kittigaruit.

Caribou hunting was intensified during the fall as prime skins were collected for the people's own use and for trade; umiaks were used to transport the dried meat, fat, and skins to Nuvurak before freeze-up. The early part of the winter was spent in semi-subterreanean multi-family houses similar to those of the Kittegaryumiut. Richardson (1851: 254) saw seven or eight such houses and a *kajigi* at Nuvurak; smaller groups of houses occur at other points of land along the Beaufort Sea coast. Fishing continued during the winter, as well as seal hunting with harpoons and nets at breathing holes. During the early winter, traders went to Kittigaruit to trade their caribou and seal skins for beluga skins which they used for boot soles and boat covers, and for European trade goods.

After the period of winter darkness, as supplies of caribou meat and fish were reduced and probably when the local seal populations had been hunted out, the Nuvorugmiut left their coastal winter houses to hunt seals from snow-houses which they built on the sea ice. Sealing was probably supplemented by fishing with jigs and hooks through sea and lake ice, and possibly by some caribou hunting in the spring, This pattern of activities continued until early summer when break-up forced the people off the ice and back into the interior for summer fishing and caribou hunting.

Little else is known of the Nuvorugmiut, and no attempt can be made at reconstructing their social organization. The material culture of this group as revealed by archeological collections (Mathiassen 1930; Gordon 1971) is generally similar to that of the Kittegaryumiut, but there are specific differences which suggest that the two groups were culturally distinct.

● *Avvagmiut:* As was noted above, Usher suggests that aboriginally there were two groups of Mackenzie Eskimos living east of Liverpool Bay, centered at Cape Bathurst and Anderson River, respectively. Petitot is the only early writer to divide the people east of Liverpool Bay into two groups: the Kramalit of Anderson River and the Kragmaliveit of Cape Bathurst, names which he probably learned from Mackenzie Delta Eskimos trading at Peel's River Post. To early traders at Peel's River Post, the eastern Eskimos were known first as Cape Bathurst Eskimos and later, when trade developed with these people at Fort Good Hope and Fort Anderson, as Anderson River Eskimos. It seems likely that these names referred to the same territorial groups who used Cape Bathurst as a summer whaling station (where they were met by Richardson in 1826 and by various Franklin search expeditions around 1850) and the Anderson River valley as a fall and winter caribou hunting area; the river later became their trade route to Fort Good Hope and Fort Anderson. Stefansson (1919: 25) described such a pattern for the early 20th century Cape Bathurst Eskimos. This supposition is supported by Roderick MacFarlane's (1889?) statement: "The Esquimaux who used to frequent Fort Anderson succeeded most seasons in killing one but seldom as many as two large-sized whales which proved of immense value to them as an article of food. They band together and hunt it in the manner described by Dr. Richardson in his Arctic Searching Expedition." These Anderson River Eskimos could have hunted bowhead whales only at Cape Bathurst, where in 1848, the Eskimos told Richardson that they killed two and very rarely three whales during the summer. The Cape Bathurst Eskimos seem to have frequented the area around the mouth of Anderson River, where in the spring of 1865, Petitot (1887) found a village of a dozen snow-houses belonging to the "Kragmaliveit" or Cape Bathurst tribe, again suggesting a single territorial group living to the east of Liverpool Bay.

Stefansson (1919: 25) states that the Cape Bathurst Eskimos inhabited the coast as far east as Langton Bay, and that Cape Parry and the coast east to Coronation Gulf was inhabited prior to 1840 by a group whom the Cape Bathurst Eskimos considered to be strangers. Langton Bay was uninhabited when MacFarlane (1889?) visited it in 1862. Evidence of earlier occupation of this area and the coast to the east is probably based on the presence of Thule culture winter houses and does not relate to the late aboriginal period.

If the hypothesis of a single group of Eskimos occupying the Cape Bathurst–Anderson River region is acceptable, we may reconstruct a seasonal economic cycle for them which resembles that of the Nuvorugmiut. Bowhead whales were hunted in August from umiaks and perhaps from kayaks in the open sea (and not in ice leads as was done in North Alaska). Whaling was probably a communal activity with as many boats as possible taking part in a hunt and kill (MacFarlane 1889?), and the greatest seasonal concentration of population probably occurred at Cape Bathurst at this time (Richardson 1851: 267). Seals and walruses were also taken in open water (MacFarlane 1889?, 1908). Fall brought an intensification of caribou hunting, and it was probably at this time on the Anderson River that the Avvagmiut met and traded with the Bâtard Loucheux (MacFarlane 1857: 259), a group of the Hare tribe (Osgood 1934: 175).

They passed early winter in permanent winter houses similar to those of the Kittegaryumiut, living on stores of meat and blubber from the previous summer's sea hunting, and on caribou and fish from the fall hunt (MacFarlane 1908). Richardson (1851: 269) was told that individual families owned hunting territories around their winter houses which were scattered singly or in small groups along the coast of Bathurst Peninsula. A winter *kajigi* of snow was built at Avvak, the central village of this group (Stefansson 1919: 176). The *kajigit* of the Mackenzie Delta Eskimos were apparently summer structures used as men's houses, and it may be that the winter *kajigi* at Cape Bathurst was used as a dance house in the Central Eskimo fashion.

In the later winter, as supplies were depleted, the people moved into snow-houses built on the sea ice and concentrated on hunting seals. First, the seals were harpooned at breathing holes located with the help of dogs, and later they were caught in nets set in tide cracks and hunted with bows when the seals basked on the ice. Sealing with nets continued into summer in the muddy waters off the mouth of Horton River (Stefansson 1919: 348, 352). This phase continued until break-up, when caribou hunting and fishing in the Anderson River valley and in the interior of Bathurst Peninsula occupied them until the communal whale hunt at Cape Bathurst.

Our evidence is too limited to reconstruct any other aspects of Avvagmiut life during the aboriginal period.

Conclusions

The historical evidence presented above documents the existence, prior to A.D. 1900, of a populous and culturally unique people occupying the Mackenzie Delta region.

During the 19th century the Kittegarymiut were the largest group of Mackenzie Eskimos and were characterized by a distinctive beluga hunting adaptation which saw the estuary of East Channel used as a trap for white whales (McGhee 1971; Nuligak 1966: 14–15). This adaptation has been traced archeologically for about 500 years in the past.

It does not seem impossible that the ancestors of the Kittegaryumiut, and perhaps of other Mackenzie Eskimos, may have been part of an older cultural pattern, perhaps of riverine-adapted peoples occupying the interior areas from the Bering Sea to the Mackenzie River. In the Mackenzie Delta, as in western Alaska, this pattern may not have been completely obliterated by the development and spread of Thule culture. The present work has demonstrated the ability of the Kittegaryumiut to maintain a distinctive and remarkably rich cultural tradition over the past 500 years. The source and early history of this tradition remains a mystery, and we should not be surprised to find that the remote ancestors of the Kittegaryumiut were as unique as were their descendants of the historic period.

References

Armstrong, Alexander
1857 *A Personal Narrative of the Discovery of the North-West Passage.* Hurst and Blackett, London.

Collinson, Richard
1875 Notes on the state of the ice. In Clements R. Markham (editor), *A Selection of Papers on Arctic Geography and Ethnology,* 1: 105–144. J. Murray, London.

Franklin, Sir John
1828 *Narrative of a Second Expedition to the Shores of the Polar Sea in the Years 1825, 1826, and 1827.* J. Murray, London.

Gordon, Bryan C.
1971 Salvage archaeology at Point Atkinson, Northwest Territories. Manuscript #203, Archaeology Survey of Canada, Ottawa.

Gubser, Nicholas J.
1965 *The Nunamiut Eskimos, Hunters of Caribou.* Yale University Press, New Haven and London.

Hooper, W. H.
1853 *Ten Months Among the Tents of the Tuski.* J. Murray, London.

Jenness, Diamond
1914 Archaeological notes on Eskimo ruins at Barter Island on the Arctic Coast of Alaska. Manuscript #779, Archaeology Survey of Canada, Ottawa.
1946 Material culture of the Copper Eskimos. *Report of the Canadian Arctic Expedition, 1913–18,* XVI. Ottawa.

MacFarlane, R.
1857 The Esquimaux of Anderson's River. Letter cited in Clements R. Markham (editor), *A Selection of Papers on Arctic Geography and Ethnology,* II: 257-259. J. Murray, London.
1889? Testimony regarding the resources of British America, made before a Canadian Senatorial Committee. Smithsonian Institution, Manuscript M14. Washington.
1908 Notes on mammals collected and observed in the northern Mackenzie River District, North-West Territories of Canada. In Charles Mair (editor), *Through the Mackenzie Basin.* William Briggs, Toronto.

Mackenzie, Alexander
1970 *The Journals and Letters of Sir Alexander Mackenzie.* W. Kaye Lamb (editor). Hackluyt Society, Cambridge.

MacNeish, R. S.
1956 Archaeological reconnaissance of the delta of the Mackenzie River and Yukon coast. *National Museum of Canada, Bulletin* 142: 46–81. Ottawa.

Marsh, D. B.
1957 *Arctic Century.* MacMillan, Toronto.

Mathiassen, Therkel
1927 Archaeology of the Central Eskimos: 1. Descriptive part. *Report of the Fifth Thule Expedition, 1921–24,* 4 (1). Copenhagen.
1930 Archaeological collections from the Western Eskimos. *Report of the Fifth Thule Expedition, 1921–24,* 10 (1). Copenhagen.

McGhee, Robert
1971 Excavation at Kittigazuit. *The Beaver,* Outfit 303, no. 2. Winnipeg.

Murdoch, J.
1892 Ethnological results of the Point Barrow Expedition. *Bureau of American Ethnology, Ninth Annual Report, 1887–8.* Washington.

Nuligak
1966 *I, Nuligak,* M. Metayer (translator). Peter Martin, Toronto.

Osborne, Douglas
1952 Late Eskimo archaeology in the Western Mackenzie Delta area. *American Antiquity,* 18 (1): 30–9.

Osgood, Cornelius
1934 Kutchin tribal distribution and synonymy. *American Anthropologist,* 36 (2): 168–179.

Petitot, Fr. Emile
1876 *Monographie des Esquimaux Tchiglit.* E. Leroux, Paris.
1887 *Les Grands Esquimaux.* E. Plon, Nourrit et Cie, Paris.

Savoie, Donat
1971 *Les Amérindiens du Nord-Ouest Canadien au XIX^{e} Siècle selon Emile Petitot. Vol. 1: Les Esquimaux Tchiglit.* Bureau des Recherches sur le Nord, Ministère des Affaires Indiennes et du Nord Canadien. Travaux de Recherches sur le Delta du Mackenzie, no. 9. Ottawa.

Simpson, John
1875 The Western Eskimo. In Clements R. Markham (editor), *A Selection of Papers on Arctic Geography and Ethnology*, vol. 1: 233–275. J. Murray, London.

Simpson, Thomas
1843 *Narrative of the Discoveries on the North Coast of America. Effected by the Officers of the Hudson's Bay Company During the Years 1836–39*. Richard Bentley, London.

Stager, J. K.
1967 Fort Anderson: The first post for trade in the western Arctic. *Geographical Bulletin*, 9 (1): 45–56.

Stefansson, V.
1913 The distribution of human and animal life in western Arctic America. *Geographical Journal*, 4 (5): 449–459.
1914 *Prehistoric and Present Commerce Among the Arctic Coast Eskimo*. Geological Survey of Canada, Museum Bulletin no. 6. Ottawa.
1919 The Stefansson–Anderson Arctic expedition: Preliminary ethnological report. *Anthropological Papers of the American Museum of Natural History*, vol. 14, part 1. New York.

Usher, Peter
1971a The Canadian western Arctic: A century of change. *Anthropologica*, N.S., 13 (1–2): 169–183.
1971b *Fur Trade Posts in the Northwest Territories: 1870–1970*. Northern Science Research Group, Department of Indian Affairs and Northern Development. Ottawa.

Wenzel, W. F.
1823 Notice of the attempts to reach the sea by Mackenzie's river. *Edinburgh Philosophical Journal*, 8: 78–79.

Fur Trade Posts of the Northwest Territories: 1870–1970*

by Peter J. Usher**

Introduction

Canadian historians have devoted considerable attention to the fur trade during its era of primacy in this country. The fur trade is commonly associated with the pre-confederation era, and even before 1867 it was being overshadowed by other developing industries.

In 1870, Rupert's Land was sold to the new Dominion of Canada, and the Hudson's Bay Company's monopoly therein terminated. The last hundred years have brought the eclipse of the fur trade as an economic endeavour of national importance. Although the total value of furs traded today is far greater than during the 18th and 19th centuries, the fur trade has become of regional significance only. Unquestionably the region most dependent on the trade has been that contained within the present boundaries of the Northwest Territories. As late as 1946, furs were the most valuable single resource exported from that territory, and even today, among the native population, more people receive income from furs than from any other resource-based activity.

The impact of the fur trade on the present settlement pattern of the N.W.T. is well known. Of the approximately 50 population centres (excluding defence and meteorological stations), over three-quarters were established for the purposes of the fur trade. What is less generally appreciated is that fur trade posts were maintained in many more places than these major centres. The produce of the hinterland was not collected solely at the established settlements. Particularly during the first part of the 20th century, the trade was carried directly to the hinterland, through the medium of permanent posts as well as individual transient buyers. The location of these permanent posts tells us much about the distribution and movements of native peoples as well as the character and *modus operandi* of the fur trade itself. Between 1870 and 1970, no less than 535 trading posts were operated in the N.W.T., at a total of 229 separate locations. It would appear that the fur trade was a strong influence for decentralizing the indigenous population at least until World War Two. Furthermore despite the recent decline of the fur economy as the mainstay of northern life, most of the present adult population born in the N.W.T. were raised in the fur trade milieu.

The year 1970 marks a useful point in time for a retrospect of the northern fur trade, not solely because a hundred years have passed since the sale of Rupert's Land. Today, very few of the establishments licensed to purchase furs can be called fur trade posts in the traditional sense. The primary function of most stores is now the retail trade, and the purchase of furs is merely an incidental function. We look back, then, on an institution now passed from the northern scene.

"Fur Trade Post" Defined

The term "fur trade post" is unfortunately not so straightforward as it might at first appear. As originally defined in section 22 of the regulations pertaining to the *Northwest Game Act,* a post was "an existing trading establishment in continuous operation for a period of two years". This was amended in 1929 to read "any kind of structure, building or tent or any means of conveyance used to contain merchandise for barter or sale, as soon as it is used for such a purpose". Subsequent stipulations required a trading post to be in operation at least eight months of the year, and an outpost at least three.

From the beginning of free access to the northern fur trade in 1870 there have been several types of traders. Some conducted a regular trade from permanent establishments consisting of a store, warehouse and dwelling. Some were chiefly trappers who maintained permanent camps, and conducted a small volume of trade to supplement their income. On the Arctic coast, many traders had schooners, which they used as "floating posts", wintering in a different place each year. In both the western and eastern Arctic whalers also engaged in the fur trade, either from their vessels as at Herschel Island, or from shore whaling stations as in Cumberland Sound or Hudson Bay. Finally there were the itinerants (especially in the Mackenzie District), who travelled about in scows or sleds with a few trade goods, only to depart upon completion of their business. The established companies viewed "tripping", as the last type of trading was called, as a serious threat to their own trade. The regulations of 1929, by stipulating the nature of the buildings and the duration of the trade, put an end to this practice, as well as to the operation of "floating posts".

This list makes no attempt to cover the activities of itinerant traders, and it includes neither the whaling stations on Baffin and Herschel islands, nor the trading vessels which often acted as "floating posts" in the early days of the western Arctic trades. Our purpose is to document only the spread of permanent trading establishments as defined in the 1929 regulations, except that no time limit has been placed on their operation. Some of the posts listed herein operated only for a single season. Also not included as true posts are those cases in which an individual operating a hotel or restaurant obtained a trading permit in order to receive payment in furs.

Yet even this limited definition of a trading post covers a wide range of activity. On one hand, there are the old established Hudson's Bay posts, with their compounds of dwellings, store and warehouse, and on the other is the lone trapper, far from any settlement, who supplemented his income by casual barter with passing Indians.

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The Fur Trade in the Northwest Territories: 1870–1970

A hundred years ago there were nine trading posts in the entire area of what is presently the Northwest Territories, all in the Mackenzie Valley. From the 1780's to 1821, the extension of the fur trade to the Mackenzie Valley was characterized by inter-company rivalry and strife. During the next few decades, the Hudson's Bay Company, enjoying the monopoly control, adjusted its trading patterns to the nature of the countryside and the people, and by 1850 the location and distribution of its main forts in the valley proved permanently set.

Despite the cession of Rupert's Land to Canada in 1870, the Hudson's Bay Company retained an effective monopoly below Fort Chipewyan for perhaps another 15 to 20 years, due to the relative isolation of the region. By 1890, however, the construction of the railroad to Edmonton, and the introduction of steam boats on the Athabaska and Mackenzie rivers had provided much easier access to the entire Mackenzie Basin.

During the 1880's there were a number of "free traders" in the Lac La Biche, Lesser Slave Lake and Peace River districts of Alberta, but few had reached Great Slave Lake before the 1890's. Those who had were itinerants, who made occasional forays through or to the region, buying a few furs en route, but certainly they did not build permanent establishments as we have defined them. Some traders even made annual fur buying excursions at least as far as Fort Resolution, either on their own or as representatives of larger firms such as MacDougall and Secord of Edmonton.

The first reasonably definite record of permanent establishments in competition with the Hudson's Bay Company north of the 60th parallel occurs in 1887. In that year, independent posts were apparently established at Old Fort Rae, Fort Providence, and Fort Good Hope. The earliest sustained competition appears to have been provided by Hislop and Nagle, of Edmonton, who opened a post at Fort Resolution about 1894, and another at Old Fort Rae shortly after. By about 1901 this firm had a chain of posts between Fort Smith and Fort McPherson, serviced by their own transportation system.

The first major influx of independent entrepreneurs came with the discovery of gold in the Yukon. According to the *Edmonton Bulletin*, of the 269 men who left for the Klondike from Edmonton in 1897, 130 took the Mackenzie River route. Some of the traders who established at Fort Resolution and Fort Providence around this time may have been gold seekers themselves who saw in the fur trade an alternative source of wealth; others may simply have sought to take advantage of the increased traffic through the region.

Despite this increase in competition, permanent posts generally continued to be located at the major fur trade "Forts" established by the Hudson's Bay Company during the 19th century, although the sites of both Rae and Wrigley were relocated on the initiative of Hislop and Nagle. Indian trappers made periodic visits to these main centres, and the major companies sometimes sent out "runners" to buy fur at the various camps. Fur buyers from Edmonton and elsewhere continued to come north each summer. Such was the pattern of trade for 25 years after the Klondike rush.

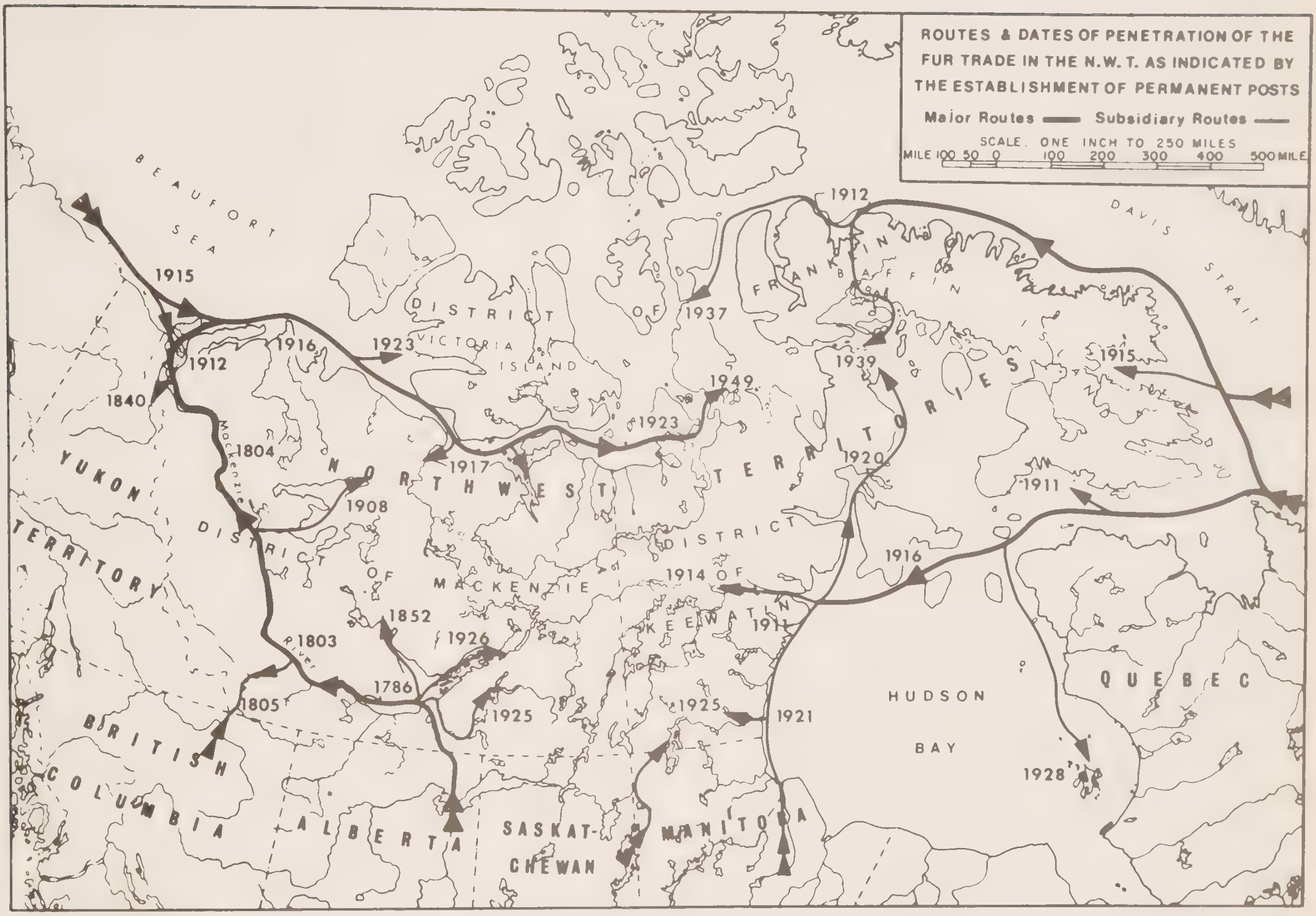
During and after World War One, fur prices rose sharply. This provided an incentive for whites already in the north to turn to independent trapping and trading, as well as encouraging men from southern Canada (often recent immigrants) and even the United States to come north to the fur districts. There were already 140 licenced white trappers in the N.W.T. in 1921–1922. This rose to 500 by 1926–1927, and stayed at or above that figure until World War Two. The great majority entered the N.W.T. by the Mackenzie system. Of these, some went directly to destinations such as Great Slave Lake, Fort Good Hope or the Mackenzie Delta, and remained there throughout their careers. Others, however, began trapping and trading around Great Slave Lake, and through the years moved to different locales down the Mackenzie, even reaching as far as Coronation Gulf on the Arctic Ocean.

The Mackenzie route, although the oldest and most commonly used, was not the only means of access to the fur trade of the N.W.T. The eastern Arctic and Hudson Bay could be reached by Davis and Hudson straits, and the western Arctic by the Bering Sea route. In these regions lived the Eskimos. Most, unlike the Indians of the Mackenzie Valley, were oriented to the harvesting of marine resources, and lived mainly on the coasts rather than inland.

Indeed, the earliest exploitation of the region by outsiders was likewise based on marine resources, for the British were whaling in Davis Strait from the early 1800's, and during the latter part of the century there were American whaling fleets in Hudson Bay and the Beaufort Sea. From the beginning, the whalers obtained fur on these voyages, but this was not their primary purpose, and even the shore-based whaling stations cannot be considered fur trade posts. The whaling captains in both the eastern and western Arctic began to show greater interest in the fur trade as a profitable enterprise in its own right during the first decade of the 20th century. This development was hastened by the decline in whale bone prices after 1906.

A parallel interest in the Arctic fur trade (based on the Arctic fox) arose on the part of the Hudson's Bay Company. For 240 years, the company had sent ships annually through Hudson Strait, but had never exploited its shores. In 1909, however, a post was established at Wolstenholme, P.Q., and within 15 years the distribution of trading posts and indeed the course of future settlement was virtually set for the entire eastern Arctic. Similarly, in the west, the fur trade frontier was extended from Herschel Island in 1915 eastward to King William Island by 1923, a distance of over 600 miles in less

Map 78
Routes and dates of penetration of the fur trade in N.W.T.



than a decade. The character of the N.W.T. fur trade after about 1920 thus differs markedly from the previous half century, since it was much more extensive and much more competitive.

The Hudson's Bay Company usually initiated expansion into new territory during the 20th century, but nowhere did it enjoy a monopoly. There were several rival companies; none operating over the entire north, and none with the same financial resources and diversified interests, but all cut sharply into "The Bay's" trade during the interwar years from 1918 to 1939. In the Mackenzie Valley there was the Northern Trading Company (successors to Hislop and Nagle), and the Lamson and Hubbard Canadian Company, on the western Arctic coast the Canalaska Trading Company, and in the Keewatin Revillon Frères Limited. On Baffin Island, a few smaller companies such as Kinnes, the Arctic Gold Exploration Syndicate, and the Sabellum Company all competed for the trade. All these companies had their own independent transport systems, operating seagoing vessels from Britain, Montreal or San Francisco, or river steamers along the Mackenzie.

Competition also came from the many independent traders and trappers, as mentioned, but their activities were restricted to the Mackenzie District and the southern Keewatin. This was due partly to the high cost or even impossibility of obtaining passage by sea, but also to the creation of the Arctic Islands Game Preserve in the 1920's, within which trapping and hunting rights were restricted to indigenous peoples.

The initially unrestricted access to the fur resource, especially in the Mackenzie, resulted in greatly increased competition among both white and native trappers. Existing trapping areas were more heavily utilized, and new ones were opened up. Certainly many white trappers established themselves far away from the major fur trade posts. High prices made the fur trade increasingly lucrative and competition between traders became very keen. Given these conditions of a dispersed trapper population, high fur prices, and a high degree of competition, traders could no longer afford to wait for the trappers to bring their produce to them. The practice of "tripping", whereby fur was purchased directly from the trapping camps by runners or itinerants, became widespread. Although both the large companies and the free traders engaged in it, it was chiefly to the advantage of the latter, since minimal capitalization was required. The companies, with their large fixed investment in buildings and transport facilities, could fare no better than an itinerant trader with a sledge load of trade goods. Partly due to pressure from the Hudson's Bay Company, the practice was outlawed, and as previously described, trade could be conducted only from fixed locations.

Thus followed a major expansion of permanent posts into the hinterland areas, which culminated in the late 1920's, although some isolated districts in the central and High Arctic were not opened until later (Map 78 indicates the routes and timing of the penetration of the fur trade). Both the companies and the independents rapidly established posts or outposts near winter encampments or along major travel routes from the hunting and trapping grounds to the forts, hoping to intercept the trade. Indeed, the locational factors in the fur trade became not unlike those in gasoline retailing, and as in that business, the independents, although in competition with the large companies, also depended on them. Many did not export their fur directly, but traded them to the larger companies in the main centres, and resupplied through these companies as well. Very often, company outposts were run not by company employees, but by independents, perhaps even using their already existing establishments, on informal arrangement.

Between the years 1925 and 1929, there were 217 trading posts in operation at 139 locations in the Northwest Territories. These years climaxed the trend toward the dispersal of the trade as well, with only 1.56 posts per location compared with 1.91 between 1910 and 1914.

With the Depression and declining fur prices, however, came a contraction and decline in the fur trade. The Hudson's Bay Company closed many of its outposts, especially in the Mackenzie Valley, in 1930, and its major competitors did not long delay in rationalizing their trading operations as well. During the late 1930's, the Northern Trading Company, the Canalaska Company and Revillon Frères all went out of business, selling their assets to the Hudson's Bay Company, leaving that firm in a monopoly position virtually everywhere but in the Mackenzie Valley and Coronation Gulf. The number of posts operating in all districts but the Mackenzie River and Mackenzie Delta declined after 1930. Those two districts, however, continued to receive independent trappers and traders, many of whom found that trapping and trading, even in their depressed state, provided a better livelihood than one could obtain "outside". There was however a tendency toward the centralization of posts in the established centres, as indicated by a rise in the number of posts per location to 1.72. Most new establishments in the late 1930's were in the larger centres such as Fort Norman and Aklavik. Many of these were erected not by newcomers but by resident traders shifting their operations from the hinterland to the settlements.

Increasing shortages of fur and game in some districts led to further government restrictions on hunting and trapping. In 1938, licences were restricted to native Indians and Eskimos, and those Whites already in possession of valid permits. No longer could men come north in hopes of making their living off the land. This brought a gradual but inevitable end to the era of the white trapper in the north, and to a lesser extent to the independent trader as well, since these occupations were so often complementary. The outbreak of war hastened the decline of the white trapping and trading community, as many left to enlist in the armed forces. By the early 1950's there were only half as many posts as 15 years before; the decline

being largely due to the folding of the larger companies and the departure of the independents.

Since the mid 1950's, the fur trade has declined, particularly in its importance in the northern economy as a whole. The extension of educational and medical facilities in the north, and the growing opportunities for wage labour, have resulted in a major shift to settlement life. The old pattern of a scattered population dependent on faunal resources has almost completely given way, despite a brief upturn in the fur trade around 1960. The Hudson's Bay Company, now the sole outlet for trade in most settlements, has closed many of its posts during the last decade. This has been due in part to the actual abandonment of some of these locations by their inhabitants, but also to changing policies on the part of the company. Most stores have become retail outlets similar to those in any small town in southern Canada, and seldom is the fur trade an important part of their business. Under such circumstances, isolated posts catering to small, semi-nomadic bands, with a very low volume and turnover of merchandise, cannot possibly be profitable, and it would appear that the company now demands each store to show a profit, rather than sustain the losses of one on the profits of the district as a whole. Pricing and credit policies appear to have changed accordingly.

Today there are 69 trading posts in the Northwest Territories, at 54 locations: 42 locations are served by only one store, nine by two stores, and three by three stores. There is now less competition in terms of the number of posts per location than at any time since the 1890's. Of the 14 places not served by the Hudson's Bay Company, six are served by independent traders (usually as outposts or branches of their main stores in larger settlements), two by native residents, and six by cooperatives. All 14 locations are presently among the smaller settlements in the Northwest Territories, and there is only one trade outlet in each.

The Mackenzie Delta Region

The fur trade in the Mackenzie Delta (Map 79 and Table 16) developed much later than up river. The Hudson's Bay Company's Fort McPherson Post, although established in 1840, remained the only post in the region until after the turn of the century, and in any case it was not strictly speaking located in the Delta. It was the terminus of the Hudson's Bay trade along the Mackenzie River, and during the 19th century was not really considered to be in a separate district. The beginnings of competition at Fort McPherson came with the establishment of a Hislop and Nagle post, contemporaneous with similar events up river.

The Delta itself had never been occupied by native people the year around. Intensive exploitation of its fur resources by Eskimos, as well as by Indians, dates from the 1900's. Aklavik was established in 1912 as the first downstream extension of the Hudson's Bay Company's chain of posts in 72 years, and other companies followed quickly. Mink and muskrat were plentiful, and rising fur prices made the Delta one of the most attractive and profitable fur trade districts in the north. Its relatively small extent and its high productivity per unit of area rendered the character of the fur trade there quite different from any other region.

The native population of the Delta was dispersed. Yet because most lived within a relatively short distance of the two main trading centres, the need for strategic outposts was less than in the other regions. In no other district were the major centres so dominant in the total regional trade. Half of all the posts that operated in the Delta were located in Fort McPherson and Aklavik, and the latter was by far the most important single fur trade centre in the entire north, in terms both of the number of traders involved and value of furs traded.

There were many independents, however, who established trapping and trading camps in the Delta away from the major centres. These trading ventures relied on a more local and restricted clientele, and were often short lived. Despite the prevalence of both independent and native traders to quite a late date throughout the Delta, the large companies generally restricted their activities to Fort McPherson and Aklavik. For a brief period in the late 1920's, the Hudson's Bay Company and the Northern Traders Limited established several outposts in the southern part of the Delta, but these were quickly closed with the onset of the Depression.

As in other regions, the late 1930's brought the demise of the Hudson's Bay Company's major competitors, as well as a decline in the independents. The subsequent decade, however, brough a resurgence in the muskrat trade, which by this time was more than ever the staple fur of the region. As a result, the number of independent as well as native trading ventures increased, and during the late 1940's there were almost as many establishments as there had been in the early 1930's, although a greater proportion were in the two main centres. The Delta did not share in the declining fur volume and opportunities for trade which occurred throughout the N.W.T. during the 1940's. Indeed, while the Arctic regions suffered an economic crisis in the late 1940's and early 1950's, record numbers of muskrat were being harvested in the Delta.

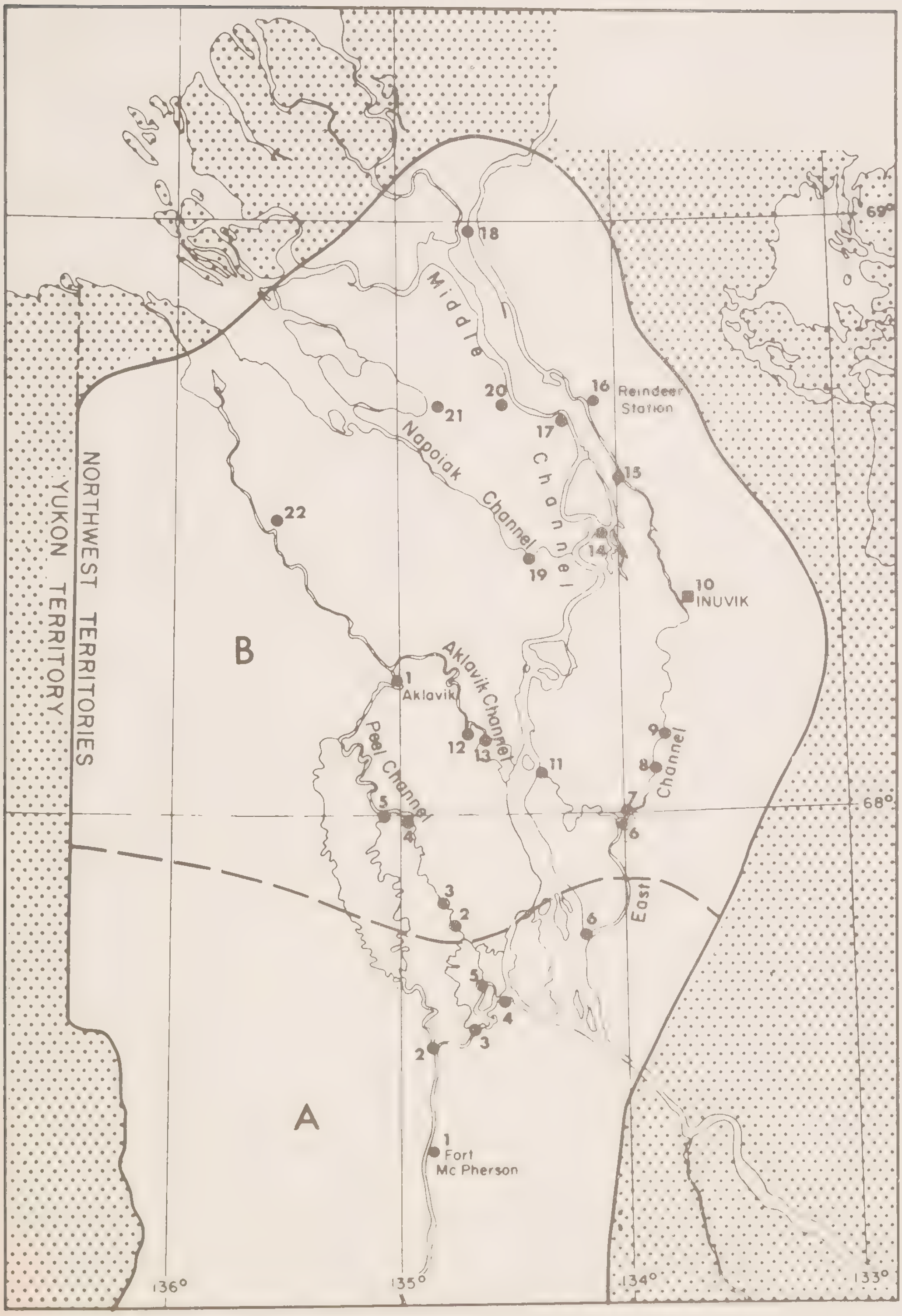
Since then, there has been a sharp and steady decline in the number of posts in the region, which has paralleled the abandonment of the ratting camps in favour of town life. All of the eight posts remaining are located in Fort McPherson, Aklavik and Inuvik. The differences in trading practices and clientele between the Bay stores and the independents in each town are as marked as anywhere in the north.

Table 16
Trading sites in the Mackenzie Delta region

Location	Years of operation	Number of posts
Sub-region A: Peel		27
1 Fort McPherson	1840–present	13
2 Husky Channel below Peel River	1926?–1935	2
3 Rotten Eye Creek	1925?–1930?	2
4 Mouth of Peel	1927?–1949*	3
5 Peel River and Peel Channel	1927?–1932?	2
6 East Channel and Main Channel	1927–1951*	5
Sub-region B: Delta		57
1 Aklavik	1912–present	29
2 Peel Channel below Peel River	1943–1957	3
3 Oniak Creek	1941–1945?	1
4 Middle Peel Channel	1936–1939?	1
5 Middle Peel Channel and Phillips Channel	1936–1964	1
6 East Channel near Kalinek Channel	1927–1939	1
7 East Channel, 68° N	1932–1933?	1
8 East Channel, Big Rock	1929–1930?	1
9 East Channel, Gull Creek	1937–1963	1
10 Inuvik	1956–present	2
11 Middle Channel near Aklavik Channel	1930–c. 1942	1
12 Aklavik Channel	1929–1930	1
13 Forks of Aklavik Channel	1943–1947	1
14 Oniak Channel and Main Channel	1928–1929	1
15 Oniak Channel and East Channel	1940–1945	1
16 Reindeer Station	1949–1968	1
17 Middle Channel near Reindeer Station	1928–1929	1
18 East Channel near Tununuk	1929–1930	1
19 Napoyak Channel	1949–1956	1
20 Axel Creek	1931–1954*	4
21 Kipnik Channel	1926–1935	2
22 Hvatum Channel	1942–1956	1
Total		84

Discontinuous operation.

Map 79
Mackenzie Delta region location map



The Arctic Coast Region

In 1870 there were no trading posts within the Arctic coast region, although the Hudson's Bay Company had maintained a post on the Anderson River for a few years during the 1860's. The Mackenzie Eskimos west of Cape Bathurst had been marginally involved in the fur trade, some actually travelling to Fort McPherson. To the east, however, the Eskimos had no contact with outside commercial ventures of any kind.

American whalers frequented the Arctic coast as far east as Cape Parry between 1889 and 1907. They were not long in recognizing the commercial significance of furs as well as whales, and by the turn of the century, the fur trade had become a profitable sideline for most whaling masters. This trade was conducted from shipboard, and such sites as Herschel and Baillie islands became important trading centres long before permanent posts were established there.

Intensive exploitation of the region's fur resources began only during the second decade of the 20th century. The trade was intensely competitive, involving chiefly the Hudson's Bay Company and some San Francisco whaling and trading firms, but also a number of Canadian and American independents. "The Bay" erected their first permanent post in the region at Kittigazuit in 1912, as an outpost of Aklavik. The company established a post at Herschel Island in 1915, and two important posts at Baillie Island and Bernard Harbour the following year (Map 80 and Table 17).

Several independents, many of them ex-whalers, had already reached the Coronation Gulf region. Such men as Wolki, Klengenberg, Bernard and Norberg were prominent in the early days of the trade, but generally traded from their schooners rather than establishing permanent posts. Such "floating posts" were common before 1920, but decreased in significance until they were prohibited by regulation in the late 1920's.

The spread of permanent posts was rapid. The Hudson's Bay Company established a post on King William Island in 1923, and subsequent competition resulted in the infilling of the more established areas. Virtually all protected harbours along the coast were used for winter trapping and trading sites. New posts were established every year, often with an eye to intercepting bands of Eskimos travelling from their winter trapping grounds to the older posts.

During the 1920's, Baillie Island was the chief trading centre east of Herschel Island, but with the declining availability of foxes in that district, the focus soon shifted to Coronation Gulf. White trappers and traders continued coming to the latter area even well into the Depression years.

The creation of the Arctic Islands Game Preserve, which by 1926 included all of the Arctic islands as well as the mainland east of Bathurst Inlet, had a profound effect on post locations. Because whites could not trap in the preserve, all but a few independents were effectively prevented from trading there as well. During the late 1920's, the Department of the Interior also sought to restrict the number of locations used by the major companies, due to a fear that the establishment of such permanent posts was adversely affecting caribou migrations. Hence, for example, the Hudson's Bay Company was asked to confine its operations on western Victoria and Banks islands to one post, and close its Perry River post altogether

The decline in trading activity along the western Arctic coast after 1930 was sharp and uninterrupted. The Canalaska Company withdrew in 1938, and many independents left the country around that time. The Hudson's Bay Company, which had closed many of its smaller posts even in the 1920's as the competing floating posts were eliminated, continued to rationalize its operations. Although the Company had opened 35 posts in the region prior to 1940, by the end of that year only nine were still in operation. Semmler, an independent who had operated several posts, mainly in Coronation Gulf, withdrew to the Mackenzie Delta in 1948. During the severe decline in fox prices around 1950, little or no profit could be obtained from the fur trade, and at several traditional locations the only trading outlets were operated by the Roman Catholic mission.

In the late 1950's and early 1960's, improved fox prices and the growth of marten trapping in the Anderson River area resulted in the opening of a few new independent posts in the western part of the region. Most have since closed, however, and with the continued rationalization by the Hudson's Bay Company, there are now only nine posts in the entire region. The Hudson's Bay Company operates one at each of the six major settlements. Of the three smaller settlements, two are served by cooperatives, and one by a local Eskimo trader.

The Eastern Arctic Region

British and American fleets whaled off the east coast of Baffin Island throughout the latter half of the 19th century. Many shore stations were maintained, particularly in Cumberland Sound, and some trade in furs was conducted at these sites as well. The establishment of posts specifically for the fur trade did not, however, occur until the 20th century (Map 81 and Table 18). At first the trade was conducted by firms or individual captains formerly in the whaling business, often at traditional sites. Such places as Cape Haven, Blacklead Island and Kekerten were whaling stations long before trading posts were established there.

While ex-whalers were opening up the fur trade on the east coast of Baffin Island, the Hudson's Bay Company was penetrating new territory on the south coast. The Company extended its operations to eastern and northern Baffin early in the 1920's, and by 1925, with the withdrawal of several

Table 17
Trading sites in the Arctic coast region

Location	Years of operation	Number of posts
Sub-region A: Beaufort		40
1 Demarcation Point	1921–1924	1
2 Herschel Island	1915–1938	1
3 Shingle Point	1917–1928	2
4 Kendall Island	1913–1928	1
5 Kittigazuit	1912–1940*	5
6 Tuktoyaktuk	1934–present	6
7 Atkinson Point	1921?–1933	1
8 Kugaluk River	1922–1939*	3
9 Anderson Forks	1926–1964*	2
10 Anderson Mouth	1918–1922	1
11 Stanton	1942–1954	1
12 Nicholson Island	1927–1929	1
13 Maitland Point	1939–1941	1
14 Cape Bathurst	1916–1939	1
15 Horton River	c. 1918–1931	2
16 Tom Cod Bay	1927?–1930?	1
17 Cape Parry	1918?–1967	2
18 Letty Harbour	1927–1959*	3
19 Paulatuk	1942–present*	2
20 Pearce Point	1922?–1934*	2
21 Sachs Harbour	1958–present	1
Sub-region B: Coronation		48
1 Inman River	1927–1932	2
2 Stapylton Bay	1921–1943*	4
3 Bernard Harbour	1916–1932	1
4 Cape Krusenstern	1926–1946	5
5 Basil Bay	1934–1938	1
6 Richardson Bay	1935–1938	1
7 Coppermine	1928–present	2
8 Asiak River	1926–1930	2
9 Kugaryuak River	1927–1940	2
10 Tree River	1917–1929	2
11 Agiak	1917–1918	1
12 Detention Harbour	1927–1928	1
13 Kater Point	1927–1929	1
14 Banks Peninsula	1926–1937	2
15 Arctic Sound	1931–1934	1

16 Hood River	1936–1941	1
17 Burnside River	1930–1964	1
18 Western River	1925–1927	1
19 Baychimo Harbour	1964–1970	1
20 Kent Peninsula	1920–1927	1
21 Wilmot Islands	1925–1941	1
22 Richardson Island	1926–1943*	3
23 "Mackenzie River", Victoria Island	1946–1948	1
24 Rymer Point	1919–1936*	2
25 Read Island	1929–1962	4
26 "Alaervik", Prince Albert Sound	1923–1928	1
27 Holman	1939–present	1
28 Walker Bay	1928–1939	2
Sub-region C: Queen Maud		19
1 Cambridge Bay	1923–present*	3
2 Ellice River	1926–1927	1
3 White Bear Point	1926–1927	1
4 Perry River	1926–1967	4
5 Sherman Inlet	1947–1955	1
6 Terror Bay	1940–1944	1
7 Simpson Strait	1923–1927	1
8 Gjoa Haven	1927–present	2
9 Spence Bay	1949–present	1
10 Oscar Bay	1928–1930	1
11 Pelly Bay	1947?–present*	3
Total		107

Discontinuous operation.

Map 80
Arctic coast region location map

Table 18
Trading sites in the eastern Arctic region

Location	Years of operation	Number of posts
Sub-region A: South Baffin		16
1 Cape Dorset	1913–present	3
2 Amadjuak	1921–1934	1
3 Lake Harbour	1911–present	1
4 Hall Bay	1914–1920	1
5 Frobisher Bay	1948–present	1
6 Ward Inlet	1922–1948	1
7 Mingoaktuk	1911?–1927?	2
8 Cape Haven	1911?–1928?	1
9 Port Burwell	1895?–present*	5
Sub-region B: East Baffin		16
1 Blacklead Island	1921–1936?	1
2 Livingstone Fiord	1924–1925	1
3 Sirmilling Bay	1921?–1925?	1
4 Oshualuk	1918–1933?	2
5 Pangnirtung	1921–present	1
6 Kekerten	c. 1915–1925?	2
7 Cape Mercy	1911?–1928?	1
8 Durban Harbour	c. 1910–1927?*	3
9 Broughton Island	1961–present	1
10 Kivitoo	1911?–1926?	1
11 Cape Henry Kater	1920–1927	1
12 Clyde River	1923–present	1
Sub-region C: North Baffin		18
1 Button Point	1914–1923?	1
2 Albert Harbour	1903–1923*	3
3 Pond Inlet	1921–present	1
4 Salmon River	1912?–1919?	1
5 "Tulukan"	1916–1920	1
6 Arctic Bay	1926–present*	2
7 Port Leopold	1926–1940*	2
8 Fort Ross	1937–1948*	1
9 Pasley Bay	1939–1940	1
10 Igloolik	1939–present*	3
11 Hall Beach	1965–present	2
Sub-region D: High Arctic		6
1 Resolute Bay	1953–present	2
2 Dundas Harbour	1934–1936	1
3 Craig Harbour	1953–1957	1
4 Grise Fiord	1957–present	2
Total		56

*Discontinuous operation.

Map 81
Eastern Arctic region location map

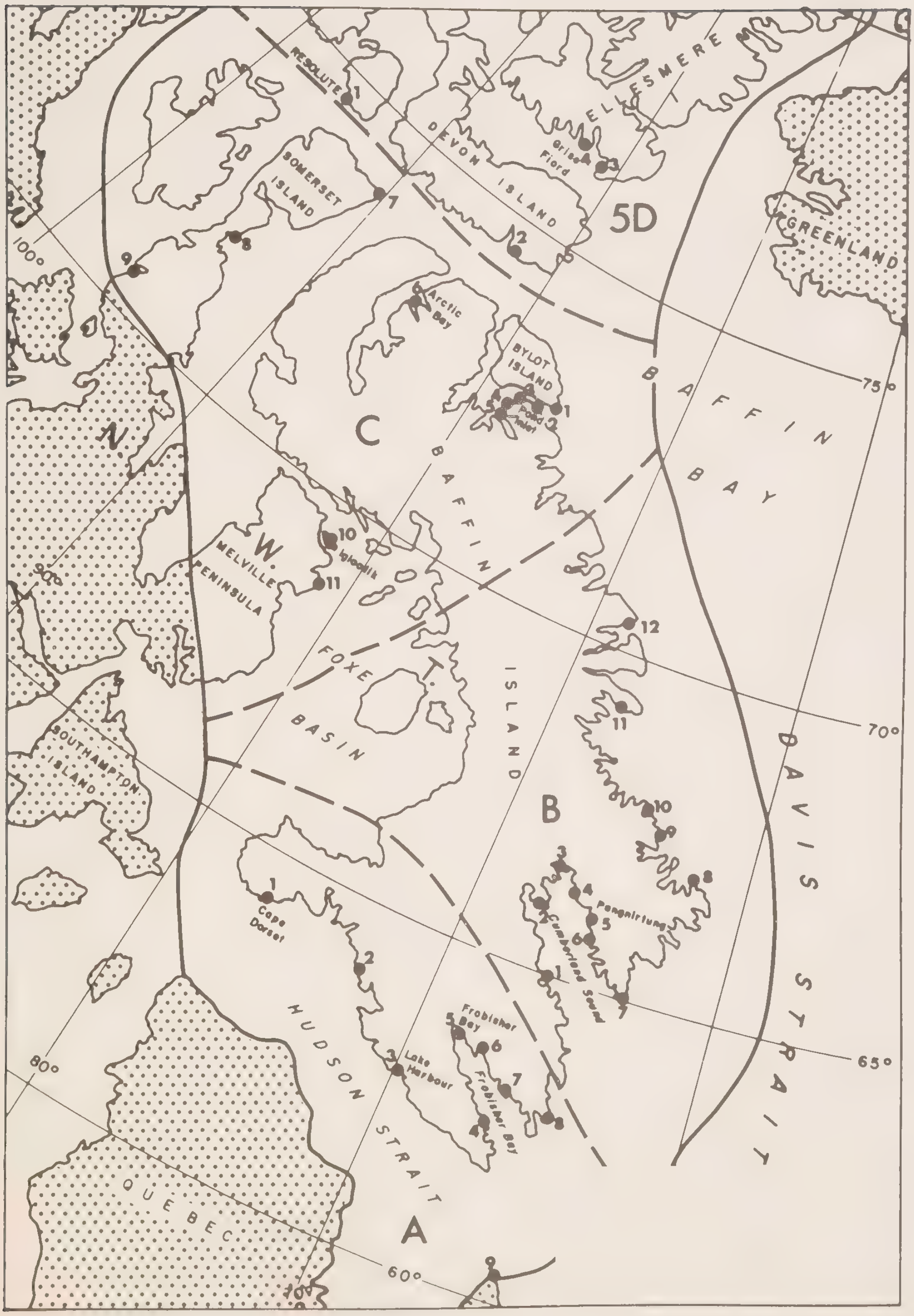


Table 19
Trading sites in the Keewatin region

Location	Years of operation	Number of posts
Sub-region A: Eskimo Point – Nueltin		14
1 Eskimo Point	1921–present	1
2 Maguse River	1938–1950	1
3 Tavani	1928?–1951	2
4 Whale Cove	1963–present	1
5 Maguse Lake	1925–1926	1
6 Padlei	1926–1960	1
7 Tha-anne River	1940–1949	1
8 Smith Bay	1928–1930	1
9 Windy River	1940–1950	1
10 Simons Lake	1928–1933	1
11 Red River	1926?–1941	2
12 Windy Lake	1928–1936	1
Sub-region B: Baker – Southampton		17
1 Rankin Inlet	1957–present	1
2 Chesterfield Inlet	1911–present	2
3 Baker Lake	1924–present	3
4 Big Hips Island	1914?–1926	1
5 Baker Lake Narrows	1920–1922	1
6 Fullerton Harbour	1913–1919	1
7 Wager Bay	1926–1947	1
8 Bury Cove	1919–1920	1
9 Repulse Bay	1920–present	3
10 Coral Harbour	1916–present*	2
11 Coats Island	1918–1928*	1
Sub-region C: Hudson Bay		5
1 Mansel Island	c. 1925–1949	1
2 Cape Smith	1924–1952	1
3 Belchers, southeast side	1928–1937	2
4 Belchers, Tukarak Island	1937–present	1
Total		36

Discontinuous operation.

Map 82
Keewatin region location map

smaller whaling and trading companies, had obtained an effective monopoly throughout the eastern Arctic.

A few ex-whalers remained in the region, trading on behalf of companies or in their own right, but there was no independent trade of any significance in the eastern Arctic. This was due to the inaccessibility of the region, as well as to the fact that by 1926 all of it lay within the boundaries of the Arctic Islands Preserve. As on the western Arctic coast, the Department of the Interior tried to restrict post locations, and the withdrawal of the Hudson's Bay Company from Port Leopold and Arctic Bay in 1927, for example, was a result of this policy.

The Hudson's Bay Company had opened 23 posts in the region prior to 1940, but by the end of that year maintained only nine of these. As on the western Arctic coast, the initial heavy penetration was partly in response to competition, and partly a means of establishing trade relations with the Eskimos at a time when fur prices were high and the incremental costs of operating additional posts low. Once the Company had established its clientele, and particularly with the decline of competition, rationalization of the trade could be effected.

The Keewatin Region

Whaling vessels, mainly from the United States, operated in the northern part of Hudson Bay during the late 19th century. Unlike the whalers on Baffin Island, however, they did not play a prominent role in the transition to the fur trade in the early 20th century. That task was left to the Hudson's Bay Company, which opened its first post in the region at Chesterfield Inlet in 1911. From here, the Company branched out westward to Baker Lake in 1914, northward to Repulse Bay in 1920, and southward to Eskimo Point in 1921 (Map 82 and Table 19).

The Company at first enjoyed a monopoly position, but opposition soon arose, chiefly from two quarters. The French firm of Revillon Frères, which had already established posts along the Ungava coast, maintained several posts on the Keewatin coast and in the southern interior between 1924 and 1936, while during the same period, several independent trader-trappers were also active in the southern interior. The independents came north through Churchill or overland via Brochet, Manitoba, while most of the Revillon posts were supplied by sea. A few independents remained in the interior until about 1950, but the Hudson's Bay Company has maintained an effective monopoly in the region since 1936.

As in other Arctic regions, the Company opened numerous posts in the early stages of the trade, but in the Keewatin, rationalization came somewhat later, with most of the Company's closures occurring between 1948 and 1960. Of the nine posts presently operating in the region, seven are maintained by the Hudson's Bay Company, while the other two are co-operative stores.

Part III:

Cultural Considerations

Introduction

Despite changes in traditional social and cultural norms since contact with aspects of western culture, Inuit values persist in the Canadian Arctic and inform the responses that people there make to present day circumstances.

In this section we present a series of papers which describe the complex and systematic nature of the Inuit adaptation to the land.

Correll's paper, by considering language usage, explores some important aspects of the relation between people and land. He demonstrates the importance of personal names in the concept of self (Guemple also deals with this subject) and points out that a crucial dyadic relationship in the Inuit view of the world is not, as it is in western societies generally, between animate and non-animate objects, but between the named and the unnamed. Man has names, so does the land: in that important respect, man and land are related. Indeed the place names applied to any individual's territory are important, not only to define that individual's land and his rights to the use of that land, but also to define the social grouping, and hence relatedness, of that individual's immediate group to its various neighbours. A systematic and formal relationship can be demonstrated whereby, despite the scattered and mobile nature of human occupation in the Arctic region, people belonged to specific territories that others recognized as theirs.

The articles in Volume Two do not explore in depth the concept of land-holding among the Inuit, but this relationship is discussed further in the occupancy report in Volume One. However, the intensity of feeling that an individual in Inuit society has for his homeland (see Arima, p. 217), and the intimate connection between a person's name and his identity (as Correll and Guemple make clear) suggest that to dispute a man's claim to his land is akin to denying his right to existence – an altogether unthinkable act to rational members of Inuit society. It is made clear in the occupancy report that, in fact, the explicit claim to ownership of land has become necessary only in the recent past when outside pressures on Inuit land amounted (in the Inuit view of the world) to an implicit denial of the Inuit right to existence. Thus the previously unquestioned must now be explicitly stated, for the validity of a long-standing system of implicit land ownership is now called into doubt by new, powerful and unknowing co-users of the land.

Correll's paper is also useful in demonstrating that the man–land relationships, of which he writes, are common to widely separated Eskimo groups, namely in Norton Sound (northwest Alaska) and the Canadian Barren Grounds respectively, which observation suggestions the unity of certain cultural traits among this geographically dispersed people. Guemple and Arima, in their reviews of aspects of the immense literature pertaining to the Eskimo world, come to the same conclusions about the widespread occurrence of certain cultural traits. For this reason the papers by Laughlin and Nelson, based on those authors' Alaskan studies, and Brody's study of "traditional" life as viewed by Inuit in the eastern Canadian Arctic have general application, and are not restricted to the specific localities they describe. Local variations in cultural form do, of course, occur, and indeed the Inuit themselves tend to stress any such differences as exist. However, these differences constitute, essentially, variations on a grand theme. Insofar as the Eskimo people have a history extending back over thousands of years, and they are the most widely dispersed aboriginal group known to have existed, and they occupy environments that range from sub-Arctic to polar and from inland to marine, it is not surprising that they should have developed different dialects and different adaptive solutions to the needs associated with living in different places. It is the persistence of conformity that amazes the observer, until he sees, in that conformity, the superb adaptability of the various cultural and social elements that persist.

Arima describes some of these persistent themes in his essay on folklore and mythology: the idea of home, the intensity of feeling for the land and the aversion to environmentally disruptive behaviour are some of his examples. Perhaps these feelings are not exclusively Inuit, but insofar as they persist (as the occupancy report testifies to), they bear on the object of this study, which is to describe the man–land relationship of the Inuit today and in the past.

Guemple, in his paper on Inuit social and territorial relations, writes of the way in which a highly mobile and widely dispersed population maintains a sense of community and of collective identity. He points out that there are, in Inuit society, several levels at which "community" can be recognized, but that there are highly defined social and cultural mechanisms that facilitate orderly change, as exigencies demand, without disrupting the social, economic, religious, and political activities that continue to function within the group. The secret of such adaptability lies in the sense of "kinship" that pervades all of Inuit society – the interpersonal bonds of relatedness that can be realized in any number of ways – examples of which Guemple provides. Thus the systematic social organization of regional populations is based on a number of sets of negotiable personal bonds that give a structure to the society by providing a network of relationships both within the local group and between the group and the larger regional and supra-regional populations.

Whereas Guemple and Correll show how individuals relate to members of other groups, or to society at large, Van de Velde describes the systematic nature of one of the means that are used to organize and structure social and economic relations in one particular Canadian Inuit group. It is important to remember that this system, although examined by itself, does not exist in isolation. The various systems that the Inuit have to facilitate, on one hand, social integration, and on the other, to ensure a satisfactory energy budget (in the form of food) have enabled this people to persist over the long term

in a demanding environment. Only a highly functional and systematic response to that environment could allow such long-term persistence, and that, by any standard, must surely be a measure of success.

The systematic nature of this response is more fully explored by Laughlin. He stresses the fact that the hunter's technological ingenuity is not the main reason for his success. The hunter devotes more time to improving his environmental knowledge and predictive skills than in any attempts at improving a technology that is already effective. Indeed, as Nelson states in an excerpt reprinted from his book, "first and foremost the Eskimo hunter is knowledgeable about every aspect of the environment he exploits". Laughlin is more explicit, and he gives details of the classes of knowledge the hunter possesses. He concludes that the profession of hunting requires expert knowledge and that the accuracy of hunter's information is reflected by his success in hunting and by comparison with independent scientific studies. Although such independent studies are few, the reader may wish to compare sample wildlife resource maps that several Inuit from the eastern Canadian Arctic have prepared (in Volume One of this report) with the material published in the *Arctic Ecology Map Series*. However, even without such a comparison, the accuracy of the hunter's information is abundantly attested by his success. Both Nelson and Usher provide examples of how successful the Inuit can be in exploiting the wildlife resources of their environment.

Usher's account of the highly systematic and adaptive nature of Inuit trapping methods is important for two principal reasons. First, because trapping, which is a relatively recent land use activity among the Inuit, has become a major economic activity for most of them throughout their lives, and still provides a substantial and meaningful occupation for many Inuit today. Secondly, the reason why trapping is considered in detail is because, as Brody points out, when Canadian Inuit refer to "traditional life" or to the qualities of "real Eskimos", they are not referring to some idealized, imagined, pre-contact, aboriginal existence that will never reappear, but they refer to the immediate past, to the period when families depended on hunting, fishing and trapping more than they do today. This period constituted the formative background experience for almost all adult Inuit alive today.

Laughlin and Usher emphasize the integrated nature of that earlier experience, and Nelson describes the human qualities it demanded. Brody and Guemple stress that continuing identification with such a life style permits the Inuit, during the period of rapid social change they face today, to maintain a vision of the society they regard as socially appropriate and proper, the society they desire and are striving to establish.

Further statements on the importance of land based activities and values to the establishment and maintenance of this social order are beyond the range of this study. But, lest any reader think the value of land to the Inuit is merely symbolic, let him remember that the appreciation and understanding of symbols is, after all, one of the cornerstones of our collective humanness. This Volume of the report stresses the long, exclusive, and systematic nature of Inuit occupation of the Arctic. Volumes One and Three make more explicit the nature of that adaptation among the Canadian Inuit.

Language and Location in Traditional Inuit Societies*

by Thomas C. Correll**

As has been noted many times, the Eskimo suffix *–miut* may be translated "the people of" or "the inhabitants of". The singular form is *–miuk*; the dual *–miuuk*. The use of the suffix by the Eskimos themselves has been such as to suggest to analysts that it provides a reliable basis for the identification of the indigenous Eskimo tribes, bands, or dialects of any area. Although some basis for the view does exist, and Swanton (1952: 556–559, and maps) so identified over 125 of these *–miut* groups, the suffix is also used by the Eskimos in a much less formal way to designate the identity of persons and groups with respect to any number of contexts or criteria. Hence, it might be true that an Eskimo at Unalakleet will identify himself as a *Maalimiuk* as opposed to any *Qauviaramiuk* or *Unaalirmiuk*. He might also specify that he is a *Sinaamiuk,* an inhabitant of the coast, as over against the *Nunamiuk,* the inhabitant of the land. He may also refer to himself as an *Ungalaqlingmiuk,* an inhabitant of Unalakleet, at a given moment rather than, for instance, a *Tsaktulingmiuk,* an inhabitant of Shaktoolik village. Hence, the normative use of the suffix reflects more a state of mind as related to a particular physico-social universe than concrete and relatively static groups.

To the extent that the world of the Inuit has been denominated through their own use of the *–miut* suffix, it is necessary to inquire further regarding the bases for that usage. It is the contention of this thesis that each *–miut* group was characterized by several defining attributes in the traditional past. Each has been researchable in the modern situation. Taken together, the attributes qualify the *–miut* groups as human cultural aggregates according to the definitions of the previous section. Each *–miut* group manifests a distinctive information regime. Furthermore:

1. Each *–miut* group is characterized by peculiarities of speech. While maintaining underlying structures which are shared by contiguous groups, each of the phonological and lexical subsystems covary for every group. Nuances of sound and meaning are incorporated and maintained as distinctives of the group. Grammatical structures tend to remain stable for contiguous communities. The *–miut* groups, therefore, constitute dialects after the definition proposed by Gumperz:

> A dialect is any of one or more varieties of a language which share at least one feature or combination of features setting them apart from other varieties of the language, and which may appropriately be treated as a unit on linguistic or non-linguistic grounds. (Gumperz 1960: 7)

This attribute of *–miut* groups can hardly be over-estimated in my view. It has frequently been recognized by researchers in the field but seldom if ever seriously researched.

2. Each *–miut* group is identified with a certain general territory. The territory is occupied and ownership maintained not merely on the basis of the physical presence of members of the group in that region but, as will be shown, one dwells in his world through language. Natural phenomena – the rivers, lakes, bays and general terrain, as well as the locations frequented by humans – are all *named*. The appellations reflect the choices and dialect peculiarities of the naming group and they are respected by the members of contiguous *–miut* groups. Boundaries between the haunts of neighbouring groups are therefore rather clearly formed – at least *in the minds* of the constituents – by the termination of place names relating to one group and the beginning of those of another.

3. Each member of a *–miut* regime considers himself or herself to be related in some way to all the other members of the group. In general, it is preferred that one find a spouse from within his or her own *–miut* group. Each group was highly endogamous in the traditional period. A number of specific means were available to members for the extension of closeness. These normally took the form of alliances and partnerships.

4. In the traditional period, each *–miut* group was constituted by several small camps or settlements. These sites were normally located at appropriate locations for seasonal or permanent procurement of food. A high density of interaction existed between these lesser aggregates, higher at any rate than existed between communities representing different *–miut* groups. Polity was focused in these villages.

It can be seen therefore that what has tentatively been called a *–miut* group refers to a human group which fulfills in large measure the requirements for identification as a *deme*. The biological deme is a local or geographic population. A deme is the fundamental corpus within which evolution occurs; it is the essential Mendelian population, "the simplest, relatively isolated, self-sufficient group . . ." (Harrison *et al.* 1964: 401). These demes exist within and as part of ecosystems: "the actual, living community satisfying its needs in dynamic relation to the habitat", and ". . . temporary in that the deme of a particular ecosystem can merge with others and split into new ones" (*ibid.*: 402).

The deme of social anthropology is also well exemplified by the *–miut* group. According to Driver, a deme is:

> . . . another territorial and political kinship unit . . . a community (village or band) which is . . . small enough so that all members are aware (either) of their bilateral genetic relationship to all or most other members of the group . . . (or) regard themselves as being genetically interrelated . . . (Driver 1961: 305)

Recently Briggs' study (1970) of the *Utkusiksalingmiut*, a *–miut* group belonging to the Netsilik tribe, makes it abundantly clear that the unit of densest transaction so far as biological, social, or linguistic interrelations are concerned, is the deme-like *–miut* group.

*This paper is a revision of material originally published in 1972 in *Ungalaqlingmiut: a study in language and society*, by Thomas C. Correll. University of Minnesota, Minneapolis, Minnesota.
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The Caribou Eskimos are a *tribe*, in the (present) usage, who are comprised by five demes: *Qairnirmiut, Saqvaqturmiut, Sauniqturmiut, Asiarmiut,* and *Paatlirmiut* (For the general distribution of these groups, see Map 83). These are essentially the same *–miut* regimes identified by Birket-Smith in his classic work on these people. The group he called Inland Padlimiut, however, are here identified by the name *Asiarmiut*.

Thanks to the Fifth Thule Expedition, the picture for the Caribou Eskimos at the time just following contact is not as incomplete as it might be. Birket-Smith's (1929) rich two-volume work preserves an unusual set of insights into the nature of their traditional societies recording population statistics and a fine collection of place names which include those of sites for camps, settlements, hunting locales, etc.

In their original distributions, the five demes of the Caribou Eskimos experienced frequent contact with one another. Members of any one of the groups claimed to have at least a few kinsmen in one or more of the others. The social organization of all five demes was identical. Their dialects were very similar. Furthermore:

1. It is the case that those Eskimos whom we call Caribou Eskimos can identify one another as to their *–miut* regime membership on the basis of their dialects.

2. The Paatlirmiut consider themselves to have unique rights and access to a certain territory. This is also true of the other Caribou Eskimo demes. The locales can be identified and located on the basis of the use of place names by members and non-members. Fundamental criteria for the alignment of deme with physical space can be discovered in the use of such names.

3. Paatlirmiut Eskimos normally have kin in one or more of the other Caribou Eskimo demes. This has frequently been the result of intermarriage, spouse exchange, adoption, immigration and trading practices. These relations are always secondary, however, to the affinity a Paatlirmiuk feels for all the other members of his *–miut* regime.

4. Paatlirmiut Eskimo peoples, like other Caribou groups in the Keewatin, were traditionally scattered in small seasonally fluctuating aggregates. Their social organization is reasonably well known.

Nunaqatigiit: Dwelling in the World Through Language

It is not merely that the sounds of speech serve as identificational criteria for assigning individuals membership in the various demes. Eskimo persons relate to their environments, human and non-human, by means of language. The manner in which a person speaks of the aspects of the environment within which he lives is a determinant of deme membership.

The ways men speak of their environments constitute a theory of their world. The repertoire of information concerning the natural and cultural surroundings available to the Eskimos through their lexicon is a means for comprehending the extent of the regime of deme rights in space. The specific sets of terms for aspects of the environment enumerate the perceived units of their world. The ways in which those terms are employed in dialogue also classify the perceived relations of men with their worlds. Briggs' description of the Utkusiksalingmiut applies to all the Eskimos I have ever known.

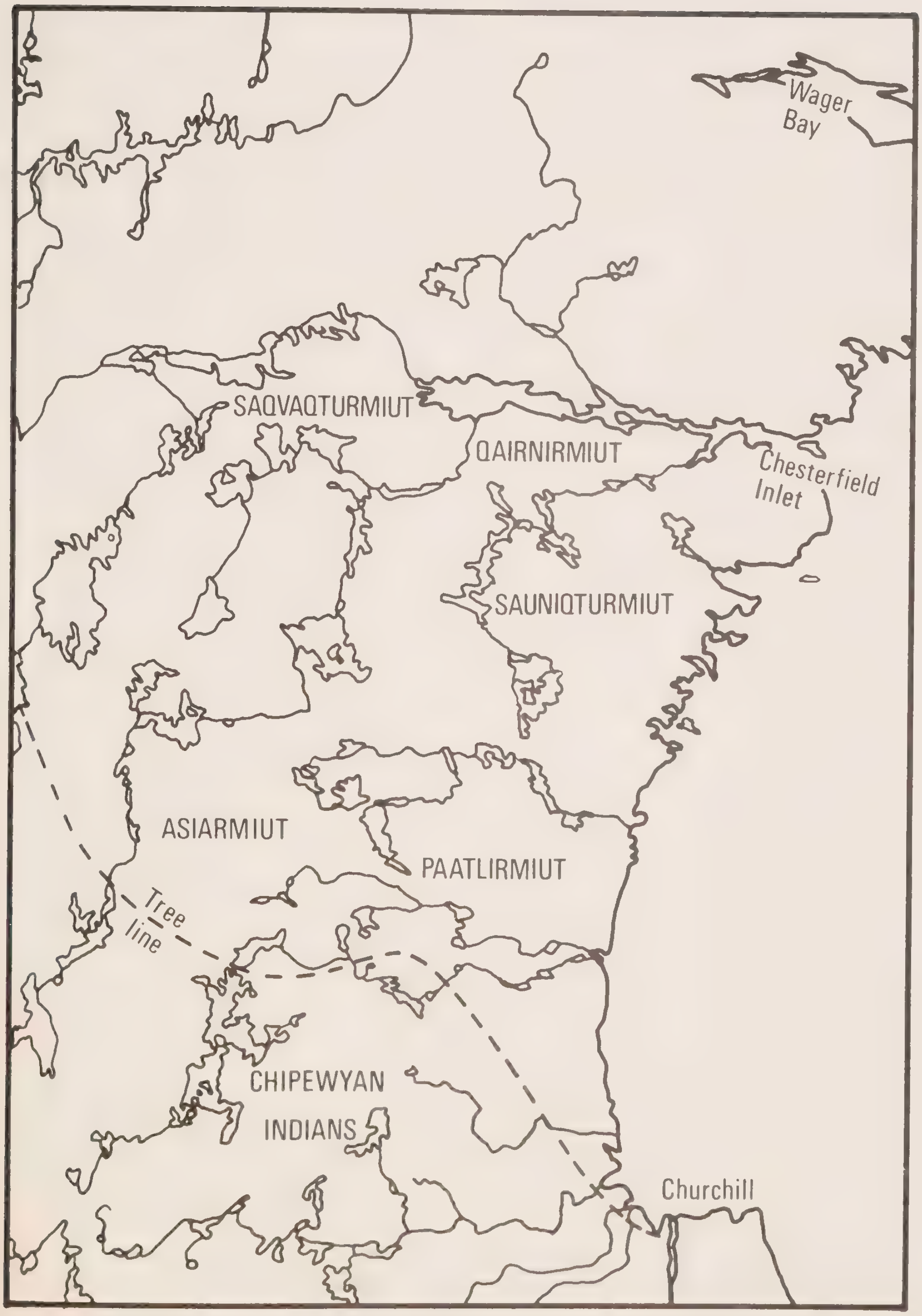
> In the course of many years of moving up and down the river, from campsite to campsite, from one fishing place to another, the countryside . . . had become to its inhabitants as grooved with association as a familiar face . . . They pointed out and named correctly all the major rivers, inlets and islands . . . (Briggs 1970: 34)

The section which follows attempts to make clear the implicit concepts of association between human groups and territory in the Eskimo view of things.

The term for "land" or "country" in Inupik and Yupik languages alike is *nuna*. Although *nuna* literally refers to land as opposed to water or air, it also connotes country in a more inclusive sense. The territory within which a man lives out his life is possessed by him. It is uncommon, in fact, to hear the term *nuna* used in its simple form. It is more normally derived for some kind of possession: *nunaga* = my land, *nunavut* = our land, *nunaqaaqpugut* = we own (possess) the country. When an Eskimo is asked where he comes from, he will respond with his deme or village membership as follows: *paatlirmiutauvunga* = I am a Paatlirmiuk, or *arviarmiutauvunga* = I am from Eskimo Point. He also may indicate the name or area he considers home: *nuumi nunaqaaqpunga* = I am from Nome. The term *nunaqatigiit*, the title of this section, is used by all Inupik speakers to mean "the people who live together at a place". In the traditional period, the phrases referred to those who shared a common life in a given situation. The ultimate referent was to deme or *–miut* group. The more immediate referents were camps and communities of all types.

At the "centre" of each deme's territory was found a cluster of simple and underived names for environmental phenomena. The area delimited by that cluster of names is called Focus rather than centre because it does not frequently approximate the actual centre of the provenience of deme rights in land. At the Focus, place names tend to be the simplest forms of the word in each case. For example, for each of the five Caribou Eskimo demes, there was a focal area where the following underived forms were used: *kuuk* = river, *tasiq* = lake, *qamaniq* = river lake, *kingaq* = hill, or mountain, *qiqiqtaq* = island, *nuvuk* = point of land, *paa* = river mouth, etc. In the case of the Paatlirmiut, they call the Maguse River *kuuk*, Dionne Lake *tasiq*, Maguse Lake *Qamaniq*, Sentry Island *qiqiqtaq*, the point of land extending from the two mouths of the Maguse River *nuvuk*. There are no real moun-

Map 83
Southern Keewatin Inuit groups



tains in the Caribou Eskimo country. The Paatlirmiut call the long esker that parallels the Maguse River and Maguse Lake *kingauratjuaq* (Map 84). In a quest for the heartland or "centre" of Paatlirmiut country, I propose that the focal area delineated by these basically underived terms is the region which was traditionally the nexus of that population's activity.

This hypothesis was confirmed in several ways. First, the people frequently spoke of that area as *paatlirmiut nunangat* = the country of the Paatliq people. When asked, they most frequently indicated the region bounded by these terms as central to their corporate life. Second, the name Paatlirmiut itself, comes from a base *paatliq* which signifies "outlet" or "opening". It is the name of a location at the outlet of the Maguse River from Maguse Lake (Map 84). It is also a generic term for all such outlets. Interestingly, a consideration of favoured sites for camps and settlements among the Paatlirmiut people reveals a preponderance of locations at or near the outlets of rivers from lakes. One old man, Atausilik, even told me that if one was looking for people in Paatlirmiut country, he would trace a river or lake to its *paatliq*. In this way he would increase the likelihood of finding people. Thirdly, consideration of favoured *apkutit* or routes through Paatlirmiut country revealed a significant number of intersections in the focal area outlined by the set of underived place names.

Outward from this Focus, place names are derived in fairly uniform ways for similar phenomena. This holds true for Paatlirmiut, Asiarmiut, Sauniqturmiut, Sarvaqturmiut, and Qairnirmiut – all the Caribou Eskimo demes. Importantly, the Focus of a territory attached to a given deme in this way is not necessarily the centre of residence or other activity. It is rather an information centre out from which directions, distances, proximal relations, routes and locations are determined.

The question concerning where the territory of one deme is considered to end and that of another to begin has been unanswered in the Eskimological literature. My perception of the problem offers a solution based on speech use. A member of any Caribou Eskimo deme was abundantly aware of the environment surrounding him. The myriad lakes, rivers, eskers, hills, islands, waterfalls, rapids, reefs, etc., were all named and remembered. In the central Arctic, most of these names are still known and used today. Some locations were and are identified for their use. Some locales are known for their adequacy as a camping spot, others for their importance in the hunting strategy, still others for the memory of some important event or person, a few for an importance associated with non-empirical phenomena and, of course, many are just names that have ever been given to the place, since before anyone can remember. From youth, an Eskimo person is taught to recognize and manipulate the environment.

When inquiring about place names and participating in relevant discussion with a given Paatlirmiut, one receives the following kinds of assertions and responses to questions.

Direct

Outwards from the Focus of his native territory, deme members will recite the place names seemingly *ad infinitum*. Taken together, such names, derived from a sample of the population, constitute an enormous lexicon of information relevant to their perceptions of the locales within which they live. Direct usages of place names are always given in the speaker's own dialect. He or she freely uses the terms.

Indirect

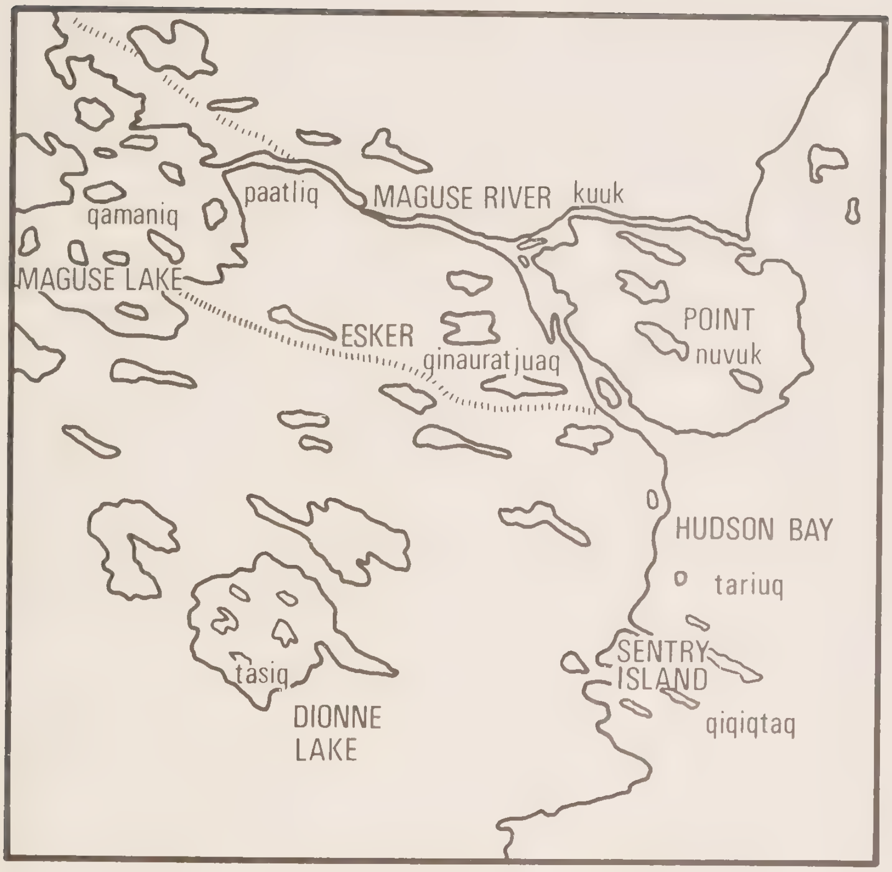
When inquiring about place names at some distance from a deme Focus, an informant will respond differently. He may say that he does not know the term or terms in question. Clearly, beyond some points, any person must admit ignorance; he simply does not know the place names due to inexperience. Secondly, he may offer the term but append it with the suffix *–guuq* = it is said, or, I heard that. In such an instance, the person is "using" (*atuqtaa*) the information. It was not a term that was learned as part of his original repertoire of environmental data. Most frequently such a response will be given in the dialect of the person from whom it was originally detected. I have never known a person to modify a name from another region into his own dialect; the original dialect distinctives are always maintained. Finally, the informant may indicate that he is not familiar with a certain name or place but state at once the name of someone who does, usually a person with some closer relationship to the area in question. That relationship may be the result of several things. He may, in fact, be a member of a contiguous deme. He may be married to a woman from the adjoining area. He may have established other trading or kin relations across a deme network boundary.

Taken together, the direct and indirect uses of names relating to the environment of deme members depict an array of information which serves to identify a territory. The Focus of the territory is that region where the unadorned, fundamental terms for significant features tend to fall together. The Periphery or boundary of a territory may be generally identified on the basis of the above mentioned criteria. It is that zone marked by the limits of specific knowledge, by the use of the suffix *–guuq* when referenced, by the use of terms from the appropriate neighbouring dialect and by the identification of local members who *know*.

On Being and Belonging

Eskimos possess a rather complex view of what man is. A person's life is spoken of as his *inuusiq*. It is the composite result of the synthesis of a number of parts in a single life.

Map 84
The Paatlirmiut Focus



One of those parts is *timi* = body. It is through the body that *inuusiq* finds expression. Another part is *anirniq* = breath. Without it no man lives and with it he relates to everything that exists in the air. Still another part is called the *tarniq*. This word has been variously translated "shadow", "soul" and "inner person". The base is *ta(q)–* from which the terms for dark, fog, shadow, and a kind of fear are derived.

The *atiq* is the remaining part of *inuusiq* which is crucial to the Eskimo concept of man. *Atiq* means "name". Every man has at least one and quite often several. By means of names, an Eskimo has access to the universe of things that have been named: *taijaujat* = the named things. Empirical and non-empirical entities have names. Animate and inanimate things have names. Human and non-human beings have names. In fact, these dichotomies are not definitive of the Eskimo view of things. The crucial dyad is between named and unnamed things. Men have names and the *nuna* has names. Man and land are related.

Thora Katchatag, one of my Unaalirmiut informants, told me that every person had a name with a place name counterpart somewhere in the surrounding country. This view was confirmed to me by several of my older Eskimo friends. However, I cannot confirm or deny Thora's statement. It is simply their belief. Whether or not it applied in the instance of every individual, even in their traditional times, I cannot know.

Shafter Tusaavik had a brother who was called "Shorty". His Eskimo name was *nuniivaq*. That is also the name of the creek south of Unalakleet alongside which he was born. One of Myles Gonongnan's sons names was *iqquq*. It is a common name among the Eskimos of both Alaska and central Canada. In this case, however, he received the name because he shot his first seal just off Dexter Point which is known as *iqquq*. This practice established a certain intimacy between man and environment. By means of this use of language, one lived in his world as a member rather than as an alien.

If one combines the sense of familiarity with environment that was achieved in this way with the sense of corporate identity gained through the use of speech (discussed elsewhere), an elemental basis for understanding group solidarity is provided. The relationship that existed between speech and space is verified by the fact that place names were always and only uttered in the dialect of that group which "possessed" the area. Maalimiut and Qauviaramiut speakers unfailingly used the Unaalirmiut pronunciation of place names in Norton Sound, and except for a few exceptions they did this even when it meant a dialect shift in the middle of a stream of speech in their own language.

I was intrigued with one means that the people of Unalakleet used to teach their children both the vast array of place names and their correct pronunciation. I heard children playing what I thought was a "tongue-twister" game. They were in contest with one another to see who could repeat a set of terms faster and with fewer errors than anyone else. When I asked them to slow the text, I was surprised to discover that they were merely lists of place names. I thought that odd until I noticed that the names were always in a sequence which correlated with the actual or perceived relations of those places in nature. I took my discovery to my informants and they confirmed this was an old practice they employed to teach the children about their land. Each "tongue-twister" was a sequence that depicted an *apkuut:* a river, a stretch of coast, a sequence of hills, etc. Most important, they either started with or included the village of Unalakleet in each case. The end of those children's name chains together depicted the boundaries of Unalakleet country.

References

Birket-Smith, Kaj
1929 The Caribou Eskimos: Material and social life and their cultural position. Descriptive part I and analytical part II. *Report of the Fifth Thule Expedition 1921–24*, v. Copenhagen.

Briggs, Jean
1970 *Never in Anger: Portrait of An Eskimo Family.* Harvard University Press, Cambridge.

Correll, Thomas C.
1972 *Ungalaqlingmiut: A Study in Language and Society.* University of Minnesota, Ph.D. thesis.

Gumperz, John L.
1962 Types of linguistic communities. *Anthropological Linguistics,* 4 (1): 28–40.

Harrison, G. A. *et. al.*
1964 *Human Biology. An Introduction to Human Evolution, Variation and Growth.* Clarendon Press, Oxford.

Swanton, John R.
1952 The Indian tribes of North America. *Bureau of American Ethnology, Bulletin,* 145. Washington.

The Institutional Flexibility of Inuit Social Life

by Lee Guemple*

Introduction

In this brief paper I will describe some elements of Inuit social and cultural organization, and relate these forms to the ecological realities of the Arctic regions. Unfortunately much of the rich variation in social form which occurs among the various Inuit groups has been omitted due to need for brevity. However, hopefully no major distortion has resulted from so attenuated an account, though some injustice to the intricacies and refinements of Inuit life ways is inevitable under these circumstances.

The viewpoint espoused here is that the connection between social life and natural habitat is a systemic one, that is to say, that changes in nature effect changes in social form in a determinate way until an adaptive response is achieved. The situation then remains "stable" until a disturbance in the factors which make up the system brings on another adjustment of the parts. In a highly industrialized society where energy control can reach massive levels, and is directed toward technologic regulation of relationships between nature and man, the causal connection between variables is roughly symmetrical, that is to say man, working through his culture, transforms nature to about the same extent that nature affects man. Thus, aspects of the culture, more especially science and technology, form a cushion between man and the vagaries of the universe. In hunting societies, on the contrary, it is generally the social system (rather than technology) that must make most of the adjustments. Lacking an industrial technology with which to control, store, transmit and utilize energy, the hunter must strive to accommodate his social institutions to what nature is prepared to yield. It was these "facts of life" that played such a profound role in shaping the traditional social institutions of the Inuit.

The Nature of the Resource Base

If we examine the resource base which traditional Inuit social organization was designed to cope with we find that its most profound characteristic was its pervasive uncertainty. Exploitable resources were differentially distributed over land and sea so that more than one habitat regime had to be worked in order to produce a living. The resources varied in availability from one season to another and from year to year (see chapter by Peterson, p. 85). Moreover, intensive harvesting over an extended period of time would deplete the supply, and recovery by natural processes took a long time.

These factors had a profound impact upon social and cultural life. Importantly, they generally discouraged large concentrations of people, except at certain especially favoured locations or for short periods of time, and resulted therefore in small sized local communities. The nature of the resource base also encouraged varied exploitative skills and sets of associated behaviour and extensive knowledge of the environment, rather than focusing competence on any particular resource. Such environmental circumstances also required that the social groups be able to plan with a high degree of effectiveness where to locate, what resources to seek and how best to exploit them at each particular season. In social terms such demands would require a flexible yet formally recognized social system enabling constant grouping and regrouping of people to best exploit the variable environmental opportunities.

Social Organization

I turn now to consider some aspects of Inuit social organization that illustrate the very flexible nature of Inuit social life.

The Local Group

Traditionally, Inuit formed domestic units which were quite elastic in structure. Ordinarily, a family consisted of a man, his wife and their unmarried children plus the occasional additional family member, perhaps parent(s), an orphan or adopted child(ren), or an unmarried sister or brother of the household head. It was common to see two or more families linked together through relations of parentage, siblingship or marriage forming a joint household. In some parts of the Arctic such a joint household might typically consist of a man and his married son(s), or son(s)-in-law (see Damas 1971 for a fuller discussion of variability in household composition). Decisions regarding formation of a joint household were most frequently determined by day-to-day practicalities rather than by the application of a set of predetermined rules. Thus if a woman had few brothers, she and her husband might decide to live more or less permanently with her parents, whereas if the family of her husband had few hunters then the hunter might take his wife to live with his own siblings and parents. A man might choose to set up his own household independently of his relatives, perhaps with someone with whom he had an established partnership (see following) of one sort or another. The main point to be made is that living arrangements were not easily reducible to a statement of principle, that is, that there do not appear to have been any rigid rules which governed the structure of domestic units.

Households clustered together into local hunting communities, usually situated in strategic places to take advantage of particular natural resources. The size of these communities was usually determined by the richness of the resource bases they exploited. In most Arctic localities com-

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munities generally ranged in size from six to 12 households, though on some occasions only one or two households might be as much as the local resources (or the local political structure, see Taylor 1974: 96) would sustain. The total population of such a community might vary from 35 to as many as 150 people, with a mean size of probably around 50 persons (Damas 1968: 111). The raison d'etre of these settlements was the optimization of hunting possibilities. The constituent households formed work units for productive purposes and frequently combined into multi-household work teams. They formed sharing networks for purposes of distributing what was taken from the land and sea (Damas 1972), and when they periodically were not working together, they met to perform communal rituals which promoted their sense of belonging and reinforced the ethic of sharing and cooperation between households.

The personnel of these communities, as well as the locations of the communities themselves, were constantly changing as households moved in to live and share with relatives, and then departed again to exploit opportunities elsewhere, or to visit family in other camps, or to form new settlements on their own.

In these circumstances of Arctic life, Inuit were able to create and maintain intensive relationships with each other that made possible, and in fact demanded, close cooperation. As occasion demanded they also seem to have been able to temporarily suspend such ongoing relationships and to effectively establish new and intensive social relationships by a variety of means (for a fuller discussion of this topic, the reader is referred to Guemple, editor, 1972c; see also following).

The Regional Group

In addition to the two basic social units, the household and the hunting community, there was a higher-order "community" that was recognized in the traditional society: the regional band (see Guemple 1972 for a full discussion of regional variations). The band was never a community in the fundamental sense of the term because its members never located in a single place for any appreciable period of time, and there were no opportunities for them to work or act together cooperatively as a group. They did constitute a coherent unity however in the sense that they shared a common culture and formed a relatively closed social network (see chapter by Correll, p. 173). The band was usually named, and the members of the constituent local communities within a band's territory generally identified themselves by that name. The band usually shared a single local dialect which could be recognized as distinctive by members and non-members, a distinctive clothing pattern which identified members to themselves and to others, and other cultural elements which served to set them apart from units of a like order elsewhere in the Arctic. Socially, the band was also a coherent unit. Households within the region were linked to others in the band by ties of kinship and it was among the communities in the regional band that the households moved while exploiting land and sea resources. Members of one local community were able to move to any other community within the band and they did so frequently.

There is a major question regarding precisely how the relationships between regional bands should be characterized. The sharing of a common language little differentiated into dialects and a common social and cultural tradition certainly aided Inuit in maintaining friendly relations with other bands, and evidence exists that there were indeed frequent contacts in some areas. This is little more than we should expect in a society where wide ranging geographical mobility is a necessity and where long-distance travel to find new hunting grounds or to trade is a matter of course. The evidence also shows that there were formalized bonds of friendship and kinship which united members of different bands so that a household might, upon occasion, move beyond the limits of its own regional band to take up temporary residence and sometimes permanent membership in another band elsewhere. All this suggests that there was a larger "community" beyond the level of the regional band.

The historical record also tells us that the members of one band often viewed members of other bands with hostility and suspicion, and that without the protection and patronage of some band member an outsider might be treated badly or even killed. If members of one's own band were counted as "kin", members of other bands were often, in the first instance at any rate, counted as "strangers". There is, then, the problem of how to understand and interpret these two somewhat conflicting formulations of the relations between regional band groupings. In order to reconcile this seeming opposition, it is necessary to examine the nature of the whole notion of family in Inuit society.

Kinship in Inuit Society

Inuit social organization was based on kinship. Inuit related to each other as *illa* (kin) or they related to each other only with great difficulty. To say that kinship served as the basic idiom of social relatedness does not mean that only persons related by blood or marriage were accepted as kin. Inuit relied as heavily on contacts with people that Western society would label neighbours, friends or associates. However, Inuit did so with this difference: they attempted to integrate all these individuals into a network of kinship and thus to find a way of calling all these people "relatives" of one sort or another.

In some ways Inuit organized their kinship relations very much as western society does. Inuit had no clans or lineages,

but instead they reckoned relatives through both parents; they recognized in-laws, and they had few rules governing marriage, save that a man ought not to marry his immediate family. Though there were occasionally marriages of one man to two women, these were not supported by values and beliefs which said that it was important or necessary for a man to have more than one wife. The number of such polygamous marriages was never great, for few men could afford to provide for more than one family, and mostly they were arranged to provide for widows with immature children and no relatives to care for them, unmarried girls without means, etc. (for further discussion of the extent of variation in Inuit marriage patterns, see Kjellström 1973).

Inuit stressed equity in dealing with kinsmen, rather than "degree of relatedness" as in Euro-Canadian society where, for example, a first cousin is *more* related than a second cousin, and one's obligations to him or her are correspondingly greater. The Inuit saw all kinsmen as more or less equal regardless of degree of relatedness, at least with respect to the issue of obligations to them. The concern that relationships be reliable and strong was evidently never completely satisfied in Inuit society, for individuals were continually creating new ties of dependence with non-relatives, strengthening relations with "distant" relatives and intensifying and fortifying bonds to "close" kin.

Significantly the obligations which bound kin were especially well defined in regard to the sharing of food and other resources. Every kinsman was entitled by right to the share of the catch of any household in the local hunting group; and ideally it should be a share equal to that of any other family. The reasoning behind this rule is self-evident. In a community in which every person was potentially dependent on every other for their well-being in times of shortage, it was important not to make fine distinctions about who should receive what portion of the catch. An ethic of equality ought to prevail – and did.

Perhaps the most striking feature of their kinship system was the many ways in which it was possible for one to become a kinsman. Some human societies, including Euro-Canadian society, limit kinship to those persons related by blood and marriage. In the case of blood relatives, each is irrevocably linked to the other(s) exclusively through birth right, whereas marriage, on the other hand, "creates" kinship. However, since marriage is ordinarily to only one spouse at a time and is supposed to be long-lasting, it provides only a relatively narrow, inflexible base for the conduct of social relations. Thus such blood and marriage kinship networks are relatively stable, rigid in shape, and restricted in scope.

Creating Kin from Non-Kin

To arbitrarily limit one's kin to people related only by blood and/or by marriage would be maladaptive for a society having the need for social flexibility that the Inuit evidently required. Where there is uncertainty in the availability of resources and yet firmly established rules for sharing them, the best survival strategy is to have as many relatives as possible. The Inuit wisely formulated their kinship institutions in such a way that the bond of kinship could be extended to almost everyone. To do this they used extensions of blood and marriage ties, and a good many other strategies as well.

Adoption

By some estimates (for example, Guemple 1973: 67), as many as 40 per cent of all Inuit were adopted at one time or another in the traditional communities of the north. That is, nearly half of all social relations were predicated on connections which were not, strictly speaking, blood ties. Most such adoptions were not undertaken merely out of the desirability of having young children in the household, for people sought to adopt the children of others even as they were giving up their own offspring to still other persons. The majority of these adoptions served primarily to strengthen the relationships between the parents and the adopters. To take a child was to establish a close and lasting bond of cooperation and trust between the adopters and the parents of the child, as well as between the children of the families involved.

Spouse Exchange

Marriage institutions also exhibited this same tendency to fluidity. In traditional Inuit society, spouse exchange was carried out to create, through the medium of marriage alliance between two families, the kind of cooperative working relationship which ordinarily was obtained between blood relatives and in-laws (Guemple 1961: 49 ff.). Thus a hunter, anxious to consolidate a mutually advantageous relationship with another hunter, might negotiate an exchange of spouses. Once accomplished, that man's family and that of his exchange partner were forever united into a single joint family. Not only were his partner's children now as his own children, but the alliance might reach further uniting the entire families of the two exchange partners, which bond might in future be important as a basis for cooperative effort.

Betrothal

There were a variety of other practices in Inuit society used to create permanent, effective, bonds of kinship between distantly related, or even hitherto unrelated, families. For example, there was the widespread custom involving betrothal of young

Table 20
Distribution of various partnerships among Inuit groups in the central Canadian Arctic (after Damas 1973)

Basis for social relationship	Copper Inuit	Netsilik Inuit	Igloolik Inuit
Spouse exchange	x	x	x
Child betrothal	x	x	x
Adoption	x	x	x
Name-avoidance	x	x	x
Rough-joking	x	x	x
Mock antagonism		x	x
Seal-sharing	x	x	
Similar ages		x	x
Trading partners		x	x
Dancing partners	x	x	x
Namesakes	x	x	x

children, in which parents pledged their young children, sometimes even before birth, to be married when they matured (Kjellström 1973: 70). This promise between the parents served as the basis for an alliance between the families of the betrothed. Throughout much of the Arctic, the children might not marry upon reaching adulthood for a variety of reasons. Many arranged marriages were consummated, however, and even if they were not, the agreement which linked the two families nonetheless served to create close ties of co-operation between the two families, and gave them a basis for treating each other as kinsmen.

Partnerships

In the central and western Canadian Arctic, and also in Alaska more especially, there was a tradition of establishing partnerships, or voluntary associations, between individuals as a means of facilitating certain cooperative endeavours for the mutual benefit of both partners. Individuals forming such partnerships were, in most cases, either distant kin or otherwise unrelated to each other. However, by the exercise of the prerogatives of the partnership, they came to call each other kinsmen.

In some cases, as for example joking partners in the central Canadian Arctic, partners could only be chosen from outside of one's kin group (Damas 1973: 45) (Table 20).

Dancing partners, boxing and wrestling partners, trading partners, song-duel partners and others are variously recorded from among Inuit groups from Siberia to Greenland and though, in some localities, certain of these partnerships might vary in form or social significance, or be absent altogether, such institutions in one form or another occurred throughout the Inuit world. Table 20 indicates the known distribution of some of these ally-creating institutions in three Inuit societies (see chapter by Van de Velde, p. 187, for a description of seal sharing partnerships among the Netsilik).

Among certain eastern Arctic Inuit groups, especially those of the Ungava-Labrador region, there were ritual relationships linking individuals in the society to new-born children, a ritual relationship akin to the god-parent relationship in Western society, but one that among the Inuit has life-long and profound social implications (Guemple 1969). Other significant social bonding occurred between the neonate and the midwife in certain groups (e.g. Ben-Dor 1966: 79-80).

Namesakes

In all human societies an individual needs to view himself or herself in relation to the world in such a way that life as it must be lived becomes both rational and acceptable. To understand how this is effected in traditional Inuit society it becomes necessary to consider the Inuit conceptualization of the soul, and then to consider how this particular formulation supports the structure of the social system.

Traditionally, the soul or spirit was said to be attached to an individual's name, or names, acquired at birth and embodying the basic identity that the individual would manifest as an adult. The spirit entered the child at birth and the process of naming a child amounted to discovering by divination what spirit had come to inhabit it. The name-spirit linked the child to the past, to his ancestors, for the name came to the child from some living or dead incumbent who also possessed the name and with it the attributes that the child inherited. These included character and personality traits, aptitude for certain skills, and so on. Thus the naming of a child was not precisely the giving of a name; it was more like bestowing or confirming a share in an identity. Inuit conceived of the name-spirit as a unitary identity participated in jointly by several individuals, both living and dead. It was not precisely a theory of reincarnation, but more like continuous incarnation (see Guemple 1965 for a fuller discussion of namesake relationships). Together with the body and the breath, the Inuit traditionally conceived of the name-spirit as all that was essential to constitute a complete human being.

The name-spirit institution had important implications for the conduct of interpersonal relationships and between individuals and their natural surroundings. For example, it early encouraged the development of autonomy in individuals, for children were treated with the respect and integrity due their ancestral or living adult namesake. Further, because an individual's personality and aptitude for skill acquisition was in large degree derived from the namesake, that individual was "fated" to make his/her own way, as best he/she could, in the

world, again stressing to the individual the importance of self-reliance.

The name-spirit convention helped to create and consolidate social connections. Since individuals having the same name were, by definition, the same person, the relatives of these individuals were, by implication, relatives common to all those who shared the name. In principle, he/she might have several "families" – as many as there were sets of relatives linked to the ones with whom he/she shared his/her name. From the point of view of name sharing then, his/her kin-group included anyone who shared a repertoire of names possessed by those known to be connected to him/her by cooperative ties. The usage might even be employed with strangers, members of other regional bands, if the occasion demanded. A person encountering a group of people among whom he/she had no known relatives or allies, could enquire about their names and, finding one that was the same as his/her own, or even the name of a relative, might declare that he/she and the bearer were relatives. This would provide a recognized basis for working together, regardless of how tenuous the connection might be when reckoned by other means.

The cooperation that sharing of a name might inspire was practically boundless. Since the logic of the usage stipulated that the bearers of the same name, in effect, shared an identity, they could deny each other nothing. This led to institutionalized intimacy between them. Sometimes parents "discovered" that the spirit inhabiting their new born was that of some prestigious and able community member, perhaps a skilled hunter, or a well reputed kayak builder, for example. In this way the best producers of the community were linked to others, including the less able, by connections which facilitated various transactions between them.

The Adaptiveness of Flexibility in Social Relations: Summary

These social usages, taken together, form a picture of a local community strung together by a tightly woven network of social relations of various types, all useful in the sense that they provided many bases for working and sharing together, but with the added feature of being far more flexible than would be possible if Inuit relied on a relatively restricted formulation of kinship. Using blood and marriage, adoption, spouse exchange, name-spirit relations, partnerships, and other social conventions, the individual need never want for relatives in such a community. And, when a stranger arrived, he might be quickly incorporated into the community by initiating one or another form of kinship alliance.

A vital dependence on land and sea, and seasonally mobile resources, caused human life in the north to be both nomadic and at times precarious. This in turn tended periodically to fragment social relations forcing family households to combine and recombine in order to best secure an adequate living. At the same time, success in the economic enterprise required that men cooperate in securing food and be willing to share the product of the hunt. In order to satisfy these two requirements the Inuit employed a variety of social institutions to increase the strength and effectiveness of their mutual obligations and were enabled to better overcome periodic shortages in supply by the judicious use of extensive distributional procedures. These usages were reinforced by an ethic which asserted the principles of equality and independence so that all might participate in the system without being bound by parochial loyalities.

Postscript

The entrance of Western civilization into the Arctic effected various abrupt changes in the aboriginal adjustment that formerly existed between man and nature in the north. For example, the introduction of firearms encouraged independent hunting at the expense of cooperative group hunting and quickly altered both the seasonal distribution of Inuit on the land and the mutual social dependencies which the traditional hunting communities fostered (Balikci 1964). Overhunting in support of the fur trade led eventually to the depletion of caribou and certain other animal populations and forced the Inuit into a more intensive dependency upon outsiders for clothing and other vital supplies.

Simultaneously with these ecological changes in the north, Westerners took with them a belief system and ethical stance incompatible with the hitherto socially appropriate world view of the Inuit. Insisting that, for example, spouse exchange, plural marriage, and infant betrothal were incompatible with their own standards, Westerners exhorted the Inuit to abandon these institutions, further attenuating the network of mutual dependency and cooperation.

These and other measures have caused stress to the man-nature system that the Inuit have carefully elaborated over the centuries of living in the Arctic. However, much remains of the traditional world view, and the experience anthropologists have gained from studying other traditional societies faced with similar culture contact experiences suggests that determined efforts will likely be made by Inuit to re-establish a rational order based on those as yet unassailed traditional beliefs that still remain.

References

Balikci, Asen
1964 *Development of basic socio-economic units in two Eskimo communities.* National Museum of Canada, Bulletin 202. Pp. 114.

Ben-Dor, Shmuel
1966 *Makkovik: Eskimos and Settlers in a Labrador community.* Newfoundland Social and Economic Studies, no. 4. Pp. 208.

Damas, David
1968 The diversity of Eskimo societies. Pp. 111–117. In R. B. Lee and I. Devore (editors), *Man the Hunter*. Aldine. Chicago.
1971 The problem of the Eskimo family. Pp. 54–78. In K. Ishwaran (editor), *The Canadian family.* Holt, Rinehart, Winston, Toronto.
1972 Central Eskimo systems of food sharing. *Ethnology,* 11 (3): 220–240.
1973 The structure of central Eskimo associations. Pp. 40–55. In Lee Guemple (editor), *Alliance in Eskimo Society.* Proceedings of the American Ethnological Society, 1971, Supplement. University of Washington Press, Seattle.

Guemple, D. L.
1961 *Inuit Spouse Exchange.* University Microfilms, Ann Arbor.
1965 Saunik: Name sharing as a factor governing Eskimo kinship terms. *Ethnology,* 4 (3): 323–335.
1969 The Eskimo ritual sponsor: A problem in the fusion of semantic domains. *Ethnology,* 8 (4): 468–483.

Guemple, Lee
1972a Eskimo band organization and the "D. P. Camp" hypothesis. *Arctic Anthropology,* 9 (2): 80–112.
1972b Kinship and alliance in Belcher Island society. Pp. 56–78. In Lee Guemple (editor), *Alliance in Eskimo Society.* Proceedings of the American Ethnological Society, 1971, Supplement. University of Washington Press, Seattle.

Guemple, Lee (editor)
1972c *Alliance in Eskimo Society.* Proceedings of the American Ethnological Society, 1971, Supplement. University of Washington Press, Seattle.

Kjellström, Rolf
1973 *Eskimo marriage.* Nordiska museets Handlingar 80. Lund.

Taylor, J. Garth
1974 *Labrador Eskimo settlements of the early contact period.* National Museum of Man, Publications in Ethnology, 9. Pp. 102.

Seal Sharing Partnerships among the Pelly Bay Inuit*

by Frans Van de Velde, O.M.I.**

The Eskimo of Pelly Bay, the Arvilinghuarmiut, have kept the custom, practically lost elsewhere, of joining forces in the winter to hunt seals through the *aglu,* the breathing hole in the ice. The mechanics of the hunt would be worthy of an article all by itself; what happens after the successful hunt is of concern now.

Obviously, in this kind of hunt, the Eskimos need each other in order to keep as many aglus as possible in a given area under watch, so that the seals, in need of air, will always meet an alert huntsman. Community spirit must preside over this effort and the game must belong to all, rather than to a fortunate hunter, who could not have succeeded in all probability without the help of the others. Today, one, tomorrow another, may be the fortunate one.

Custom has decreed, almost like a law, that the sharing must follow certain well defined rules: each has his piece of meat and each his piece of fat, not indiscriminately.

Springing from this custom is another: the men call each other by the name of the piece of meat which he receives as his share at the cutting up. The name of the piece of meat becomes a bond, a permanent relationship. For example, Attark would receive the shoulder when Taleriktak has harpooned a seal, and vice versa. Each is *aksatk'eligek,* shoulder partner, and calls each other as a result, "my shoulder", *aksatk'oliga.* Similar custom exists for practically every piece: *ekpatigok, sannerarek,* etc., according to which part of the seal is the basis of the relationship.

The bond between hunters is often determined from their earliest years, even before birth. Blood relationship could influence the choice, or the hope of getting a good hunter as partner for one's son. The partners thereafter call each other *nerk'aitorvigek nangminerek,* permanent partners in seal meat sharing, or partners in sharing.

According to a very old custom, if one of the two *nangminerek* happens to die and has a brother by the same mother, the deceased is replaced by him. A person having the same name as the deceased or any other hunter can also take his place. This results in a wide margin of age.

A sharing partner can also be chosen for a limited time, for example, during one camping period, even when one of the partners already has a *nerk'aitorvik nangminerek,* as long as the latter is absent. It is merely temporary, however, and he has rights only to certain parts of meat.

There are three types of partnerships: partners in the strict sense, in a wide sense, and those who are not *nangminerek.*

To show how the actual distribution between the various *nerk'aitorvik* takes place, nothing is more practical than to show the actual cutting of a carcass of a seal in a camp.

In the evening, after the hunters come home, the carving is done by the women of the successful hunter in his igloo. The women of the *nerk'aitorvik* come with their sealskin bags to get the pieces belonging to their husbands.

The seal is lying on its back. It already has a cut through which the liver, as well as the spleen and kidneys, have been taken out and eaten, as soon as the hunter brought his prize out on the ice. Through this opening, the small intestine is first cut, close to the stomach and large intestine, and made into garlands. Then the two front flippers are cut close to the joint.

From the opening up to the jaw and down to the anus, the skin and fat is cut away from the underlying meat. The seal is now flayed on both sides down to the floor, or rather, to the ice. Once the skin is opened, it serves as a platter.

The layer of fat on the belly and on the back is then removed.

The hole for the liver is again used as a point of departure for long cuts upward and downward. The knife is slid along between the bony part of the sides and the cartilaginous sheath, and the latter is folded outward.

The blood that has flowed into the belly from internal bleeding has not been lost, since, after the liver was eaten, the opening was closed with a wooden or bone pin. The blood is now taken out. Mixed with water, it will make a fine bouillon in which to cook the meat later on.

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Here is how the shares are cut, beginning with the most important (Figure 2):

1. *Okpat,* the rear portion of the seal, down from the basin that joins the spine. The strokes are transverse. Tail is not included, as it is a part of the skin. Rear flippers are parts of *okpat,* when *nangminerek* are concerned, and are often left on.

2. *Taonongaitok,* all the ribs on the right side and front part of the right side, except the end of the flippers. This piece, second in importance, may be whittled a little for children who want a *sanneraernerk.*

3. *Aksatk'olik,* the place where the upper arm grows. It corresponds to (2), but is on the left side of the seal, except the last five ribs.

4. *Kuyak,* the last four ribs on the left side, including the end of the spine, but not the last vertebra.

5. *Sannerak,* the right side of the belly, cut from top to bottom where cartilage joins the bony part of the ribs.

6. *Sannerak iglua,* the left side of the belly.

7. *Kongoserk,* neck and upper spinal column.

8. *Tamuaniark,* a mouthful. Two vertebrae and a rib above *kuyak.*

9. *Naik'ok,* head.

10. *Innaluark,* intestines. Often only a part.

11. *Tunnerdjuk,* breastbone.

12. *K'amnerk,* the last vertebra near the basin. This is separated from *kuyak.*

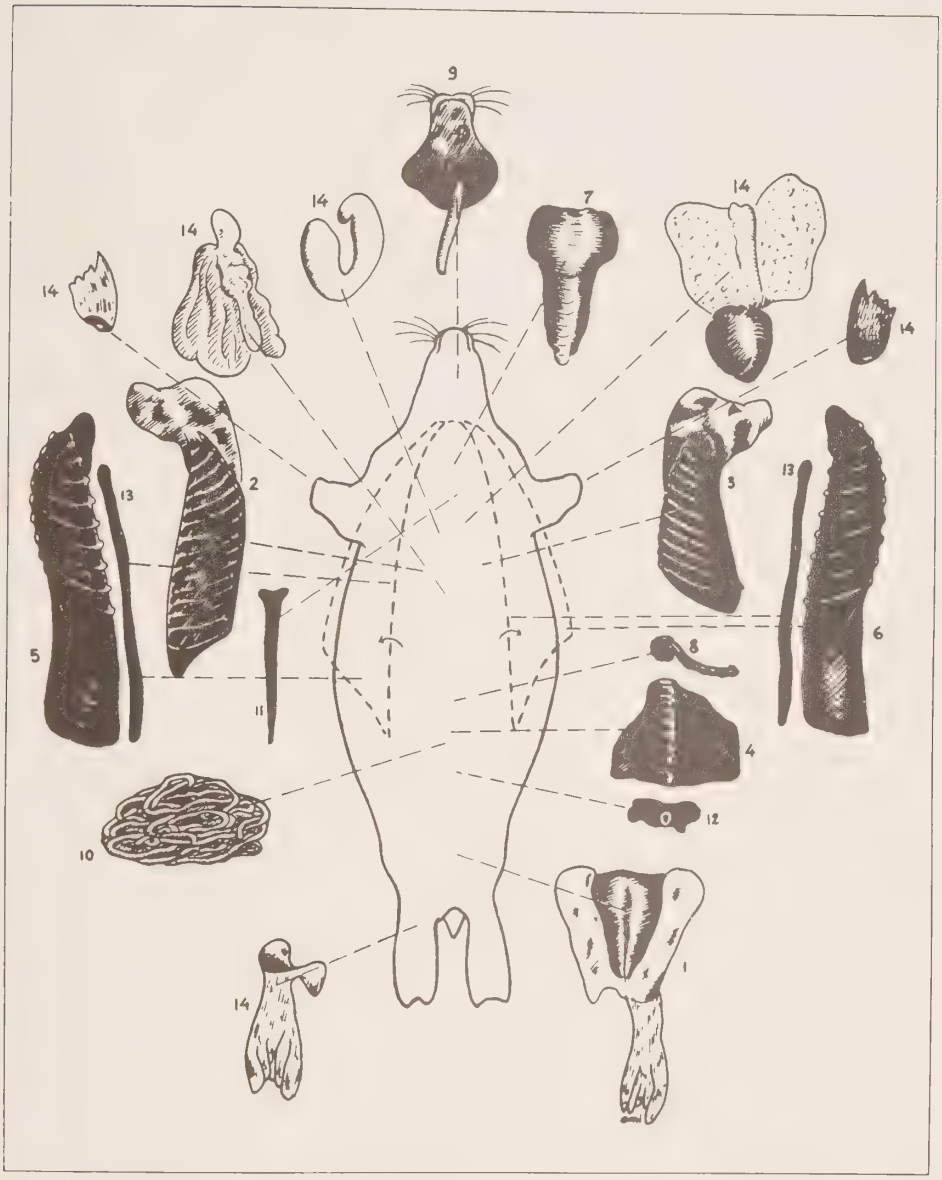
13. *Sanneraernerk,* slices from the flank. Small, long and thin pieces sliced from ganglion down to pieces (2) and (3). These slices are for the children and are hence called *nutark'ab aitjunga,* gift to the children, and also, *nutark'ab aitjuta,* something that makes children go home. No matter what the original meaning, the distribution of *sanneraernerk* has one good result. It eventually provides more room in the igloo already overcrowded with seal and women.

14. *Netjerta,* the share of the one who has killed the seal. All the viscera of chest and abdominal remnants, stomach, dorsal membrane, and often a part of the intestines. The skin, front flippers and, sometimes, one of the rear flippers are included. When the seal is a *tigak,* large adult male, the skin is often cut on both sides to make two pieces. The back skin is used as leather for boot soles.

The fat is cut up as follows:

Naark and its *iglua,* belly fat cut in two.
Awat and its *iglua,* two pieces from the flank.
Three *K'ittark,* middle pieces.
Two *K'ittauyark,* small pieces of the above.
Orksoetuyark, pieces of fat received as shares.
Irksogsiar, fat from the back.
K'ittark and *k'ittauyark* are long strips of fat cut from each side towards the back and increasingly thinner.
The last strips are cut into *orsoetuyark.*
Finally there is *kinarok,* fat from the head and shoulders.

Figure 2
Portions for distribution among meat-sharing partners
(figures correspond to those in the text)



The sharing of the pieces of meat is done as was set forth above, with each *nerk'aitorvik* receiving the piece of his name. Each chunk of meat corresponds to a piece of fat belonging to *nerk'aitorvik* as shown in Figure 3.

1. *Okpat* and *naark*.
2. *Taonongaitok* and *iglua naark*.
3. *Aksatk'olik* and *awat*.
4. *Kuyak* and *iglua awat*.
5. *Sannerak* and *k'ittark*.
6. *Sannerak iglua* and *k'ittark*.
7. *Kongoserk* and *k'ittark*.
8. *Tamuaniark* and *k'ittauyark*.
9. *Niak'ok* and *k'ittauyark*.
10. *Innaluark* and *orksoetuyark*.
11. *Tunnerdjuk* and *orksoetuyark*.
12. *K'amnerk* and *orksoetuyark*.
13. *Sanneraernerk* for children, no corresponding piece.
14. The harpooner, gets both *netjerta* and *orkosgsiar*. He also has a right to *kinarok,* but almost always gives it to his dog, thus everybody shares.

Everyone living in the camp, whether related by *nerk' aitorvigek* or not, can come to the harpooner's igloo and get some fat and *orksoetuyark*.

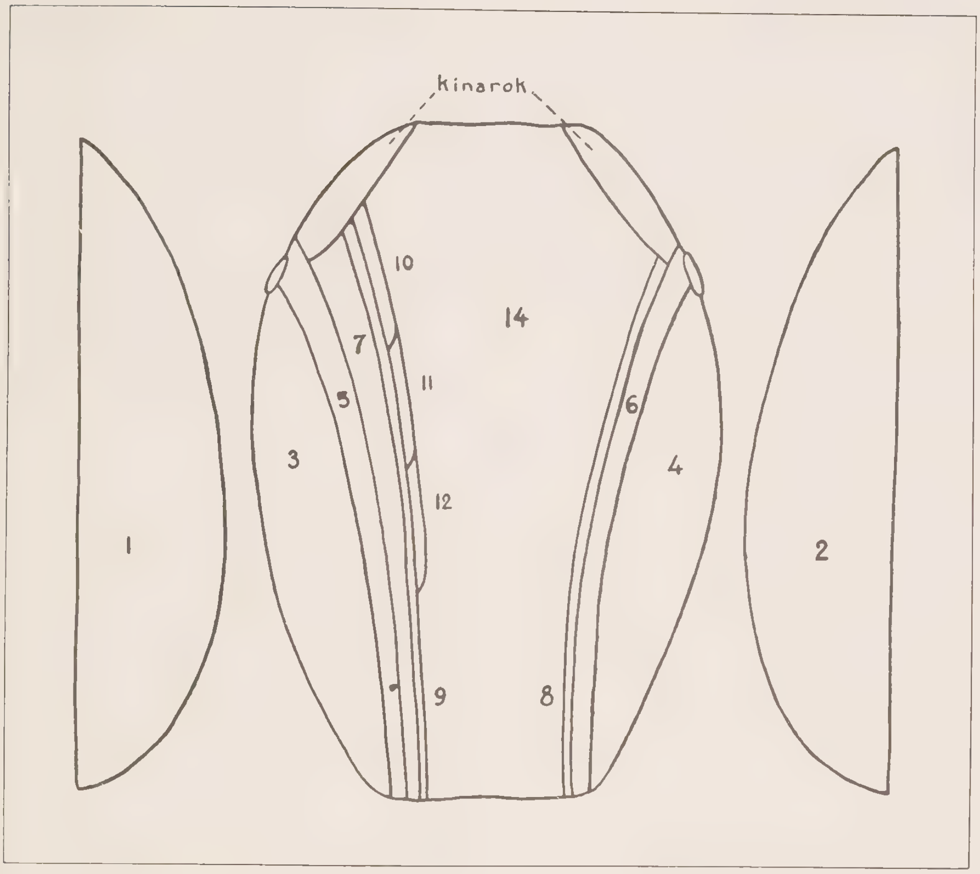
These rules apply to *aglu* hunting camps when the hunters return in the evening. If several seals are killed, people visit different igloos to claim their share. But if the hunters camp out, even together, without returning to the main camp, the rules do not apply.

In order to benefit, one only has to be in the camp at the time of the sharing. A *nerk'aitorvik* passing through receives his due share. Even a hunter living in the camp who missed the hunt benefits. If he is gone, his wife takes his share. But if a hunter dies, his widow has no claims.

It may appear surprising that the successful hunter receives so little meat. However, he receives the major part of the fat and all the pieces when no corresponding *nerk'aitorvik* is present. If a *nerk'aitorvik nangminek* is absent, a *nerk'aitorvik* of the moment may share in (1) to (7), but never in (8) to (12), which are given the hunter. A temporary *okpat* never gets rear flippers or flippers that are cut at the knee and remain attached to the skin.

This custom is found among Netjilingmiut in the widest sense, that is the inhabitants of Pelly Bay, Boothia Peninsula, King William Island and Adelaide Peninsula. However, it seems best preserved at Pelly Bay.

Figure 3
Pieces of fat that accompany the portions of meat



Hunting: An Integrating Biobehaviour System*

by William S. Laughlin**

Introduction

Hunting is the master behaviour pattern of the human species. It is the organizing activity which integrated the morphological, physiological, genetic, and intellectual aspects of the individual human organisms and of the population who compose our single species. Hunting is a way of life, not simply a "subsistence technique", which importantly involves commitments, correlates, and consequences spanning the entire biobehavioral continuum of the individual and of the species of which he is a member.

That man achieved a worldwide distribution while still a hunter reflects the enormous universality of this kind of behavioral adaptation. The corollary fact that he practised hunting for 99 per cent of his history indicates the significance of two neglected aspects: (a) hunting is a much more complex organization of behaviour than is currently admitted under the traditional "subsistence technique" categorization; and (b) the intellectual and genetic repertoire of the animal developed in this behavioral regime both permitted and enabled the recent acquisition of civilization to be a rapid acquisition and to be developed independently by hunting peoples in different parts of the world.

The total biobehavioral configuration of hunting includes the ethological training of children to be skilled observers of animal behaviour, including that of other humans. The process includes five distinguishable components whose combinations and permutations are certainly varied, but with recurrent and widely distributed commonalties.

Hunting is an active process which puts motion and direction into the diagram of man's morphology, technology, social organization, and ecological relations. Hunting involves goals and motivations for which intricate inhibition systems have been developed. Hunting has placed a premium upon inventiveness and problem solving, and has imposed a real penalty for failure to solve the problem. Therefore it has contributed as much to advancing the human species, as to holding it together within the confines of a single variable species. A study of hunting removes the tedious ambiguity contained in many current discussions of the importance of tools: whether tool use means that tools use humans or that humans use tools.

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Hunting as an Integrating Sequence Behaviour Pattern

Hunting may profitably be analyzed as a sequence pattern of behavioral complexes. This analysis recognizes the ordered interdependencies of the diverse constituent elements of hunting and it also provides a comparative basis for evaluating the functions and intensities, their similarities and dissimilarities, in radically different cultures. As defined here, hunting consists of five series of patterned activities, beginning early in childhood and extending through the life of the individual hunter. These five behaviour complexes consist of (a) programming the child; (b) the scanning or collection of information; (c) stalking and pursuit of game; (d) immobilization of game, including the killing or capture of game; and (e) retrieval of the game. Although more complexes might be added, such as those concerned with the distribution of game and its various uses, none can be subtracted without impoverishing an appreciation of hunting.

In overall perspective, both for the individual and for the evolution of mankind, this behaviour system has had an integrating function. It has served as an integrating schedule for the nervous system. Hunting is obviously an instrumental system in the real sense that something gets done, several ordered behaviours are performed with a crucial result. The technological aspects, the spears, clubs, handaxes, and all the other objects suitable for museum display, are essentially meaningless apart from the context in which they are used. They do not represent a suitable place to begin analysis because their position in the sequence is remote from the several preceding complexes.

Programming Children

Three indispensable parts of the hunting system are programmed into the child beginning early in life. These are the habit of observation, a systematic knowledge of animal behaviour, and the interpretation and appropriate action for living with animals and for utilizing them for food and fabricational purposes. Owing to the fact that in many cultures various animals are endowed with souls, that there are animal beings as well as human beings, the killing and eating of animal beings may be fraught with spiritual hazards (Rasmussen 1929: 56). Appropriate behaviour toward animals is prominently based upon familiarity with animal behaviour, and includes ways of living peacefully with animals, of maintaining a discourse with them, and the highly coordinated movements of the hunter proceeding toward a kill, as well as appropriate social behaviour where other hunters are involved. Within a single community it is possible to arrange the hunters in a rank order in terms of their efficiency or productivity. It is sometimes possible to relate lack of success to inadequate training or to the other sources of ineptitude. This

is especially apparent where the child has been removed from his village during the crucial years, or where the child has been raised by a grandmother or non-hunter who was not able to provide the necessary tuition.

In any community of hunters it is possible to find general exercises that prepare the child for active hunting, but they do not involve a specific commitment. Probably all forms of exercise are of some value, but only a few have demonstrable relevance in the sense that they are a necessary and specific prerequisite. Beginning with the different practices for the two sexes which are maximized in hunting groups, a series can be assembled. Thus, those practices leading to use of spear throwers, boomerangs, bows and arrows, lances, boats, sleds, harpoons, etc., are ordinarily restricted to males, or males are clearly favoured in systematic instruction. Nevertheless, there are few data bearing on the question of how much instruction is necessary in childhood. The best preparation for throwing a spear as an adult hunter is probably throwing one at an earlier age, but how early or how many practice hours are required is not amenable to quantified estimate. The bow and arrow is in common use among many hunters – Pygmies, Bushmen, Eskimos, various American Indians, Andamanese, Chuckchee, to name only enough to illustrate considerable diversity in the technology and use. However, most observers agree that these hunters are mediocre or indifferent as archers. They hunt effectively with their equipment, but they compensate for lack of accuracy at appreciable distances, perhaps more than 20 or 30 yards, by spending their time getting closer to the animal. In brief, these hunters clearly spend more time and attention in utilization of their knowledge of animal behaviour than in improvement of their equipment or of its use. This generalization, if well founded, probably constitutes an important aspect of primitive hunting and provides a scale for comparisons between groups.

Children were taught to close the distance between themselves and their quarry by sophisticated stalking methods that depended more upon comprehensive observation, detailed ethological knowledge and an equally detailed system of interpretation and action, than upon the improvement of their equipment and the addition of 10 or 20 yards to its effective range. In fact, one may pass from this generalization to another and suggest that the very slow improvement in technology, clubs, spears, throwing boards, bows and arrows, as indicated by the archeological record, was contingent upon success in learning animal behaviour. It was easier or more effective to instruct children in ethology, to take up the slack by minimizing their distance from the animal prey, than to invest heavily in equipment improvement. The rapid advances in archery of the last 15 years reflect an application of technological methods to archery equipment that clearly did not arise from a need to depend upon such equipment for any important portion of the annual food supply.

The difference between specifically programmed and generally programmed prerequisite childhood exercises for hunting in adulthood is epitomized in the tendon lengthening exercises for Aleut children, designed for hunting from the kayak, contrasted with their general exercises. The former focussed on the shoulder joint of the throwing arm, on the low back, and on the posterior region of the knee joint.

Very early in childhood, apparently as early as the stage of beginning to walk, the male child was placed in a sitting position on a flat surface or on a stool with his heels on another stool or box. His preceptor, a father, uncle or grandfather, stood behind or to the side of him and pulled his throwing arm up and over behind his back. This was done gently and intermittently, often with a little song or rhythmic susurration, so that several excursions were made rather than one prolonged excursion. This exercise created greater mobility at the shoulder joint and enabled the arm to move farther backward and to come directly forward in a flat, vertical plane. As a consequence, the arm functioned as a longer lever than in those persons who cannot rotate their arm backward without moving it progressively to the side of the body at the same time. A spear or harpoon could then be thrown farther, more easily, and from a greater variety of positions available to the seated kayak hunter.

The second and related exercise stretched the tendons and ligaments of the low back. The seated child, legs extended in front, was pushed forward by a hand applied to the back. This exercise specifically anticipated the considerable strain placed on the low back while paddling or throwing when seated in a kayak.

The third exercise of this series consisted of depressing the knees of the seated child so that the tendons on the posterior of the leg, especially the semimembranosus and the semitendinosus tendons in particular, were stretched. As a consequence he was enabled to sit with legs extended for long periods of time and to operate efficiently.

These three exercises were reinforced with various games. In one, the child sat on the ground, legs extended, and threw a dart at a small wooden model of a whale suspended from a flexible withe. Two boys played this game, each facing the other, with his own whale target.

An example of an exercise of general value to a kayak hunter, without specific relevance to kayak hunting, is that of finger-hanging. The young child was suspended from a ceiling beam of the house by his fingers. His preceptor then withdrew and the child hung until he was forced to drop to the floor, an earth floor covered with dried grass. The exercise was intended to strengthen the fingers and to teach the child to fall on his feet with ease and agility.

The peculiar monopoly which the Aleuts and Koniags held on sea otter hunting, and the corollary fact that no European ever became a successful kayak sea otter hunter, may be traced in part to their childhood training in both the physical

and the behavioral aspects. Many Europeans have learned to paddle kayaks, and many have learned to hunt sea mammals, but extremely few, possibly five, ever became kayak hunters. Aleuts and Koniags were transported from their homeland to alien waters off California and Japan by their Russian administrators, because of their non-duplicable skills in sea otter hunting. The point in citing this well known history is that it reflects some of the consequences of a complex hunting achievement which is demonstrably and specifically related to childhood training. While kayak hunting represents a rare technological achievement, the use of the throwing board enjoyed a much wider distribution about the world. Certainly one factor in the failure of the throwing board to diffuse from Eskimos to contiguous groups of Indians is that an essential portion of the complex rested in childhood training practices. It was not an implement, like the axe, the bow and arrow, or the rifle, which could be easily used by adults.

A fear of kayaks, as found among the Eskimos of Wainwright (Nelson 1966: 218), must be distinguished from the relatively localized "kayak fear", found in west Greenland. The possible relationship of the disease, "kayak fear" to inadequate childhood training has not been explored. The inability of adult hunters to perform normally is a generic category, and might well be especially revealing in defects in childhood programming.

Scanning

Scanning includes the collection of information on where to hunt, what to hunt, and the scheduling of a hunt. The choice of animals to be hunted and the areas which will be searched reflect sophisticated knowledge concerning the behaviour of animals, environmental conditions, and other commitments of the hunter to partners or to the portion of the community which depends upon him. His need for food and fabricational materials may outweigh several other considerations. The independence of scanning and its role may be seen in the common practices conducted prior to the pursuit or stalking of detected animals.

For several days prior to the actual detection and pursuit of an animal or herd the hunter may search an area for signs. Frequently he gets this information from other hunters. He must first find what animals are in the territory. The actual tracks, feces, and browsed plants may provide him with the information he needs. The presence of one animal may signal the presence of another so that the hunter is encouraged to continue with the inspection even if he has not actually sighted the animal he wants. He may sight the animal, or a herd, but waits for it to move into a better position, perhaps closer to camp or in a valley where more can be killed, than in the open.

In scanning, the knowledge of tracks, and indications of animals generally, is the paramount feature and obviously the complex which utilizes previously learned observational information concerning animal behaviour. The time invested in this portion of the hunting sequence is usually far greater than for any other portion except for the childhood programming.

The scanning and identification problem is quite different for the marine mammal hunter. He must proceed to the most likely area and then search for the interrupting profile of the mammal when it comes to the horizon (Laughlin 1967). He may first proceed to a mummy cave and ask for help from the hunters interred there who still maintain an active part in the affairs of living people. He certainly would utilize the information provided by watchmen who sit on vantage points and scan the sea, and the weather prognosticators. A man of meteorological sophistication, an "astronome", may even be consulted by kayak hunters (Heizer 1960: 133).

Choices of hunting routes may involve various sorts of divining, whose effect is to randomize the routes or areas searched. This is based on the fact, well known to the hunter, that animals learn the habits of humans and adjust their behaviour accordingly.

The religious elements which pervade the preparations are multitudinous and need only be called to mind here. Cleansing rites and special clothing are ubiquitous. They importantly reflect the reciprocal nature of the interaction between the beings in the animal world and those in the human, or stated less egocentrically, the contingent relations between animal beings and human beings (Marsh 1954; Hallowell 1960).

Stalking

Stalking and pursuit of game ordinarily begins once the animal has been sighted. Attention then shifts to getting as close to the animal as necessary for an effective shot. In much of hunting, however, there is no sharp line of demarcation between these two portions of the sequence pattern. The hunter may commit himself to a particular animal or herd without having actually seen it. There may be ample evidence that a particular animal is being followed, and the animal may be aware of the pursuit without an actual visual sighting. The hunter and the hunted may smell each other, they may hear each other, they may see each other's tracks, and the animal may actually be attracted to its human pursuer by his urine. Following a polar bear for one or two days, or running down a horse over a three-day period, or some of the desert hunting in Australia and in the Kalahari involve a long pursuit and relatively short period for killing.

The hunter is concerned with the freshness of the track and the direction in which he is moving. He wants all possible information on his quarry's condition: its age, sex, size, rate of travel, and an estimate of the distance by which the animal leads him. In the final stages, when he is closing on the animal, the hunter employs his knowledge of animal behaviour

relevant to the situational factors in a crucial fashion. For all birds, animals, and fish the hunter must estimate flight distance and the point at which they will take flight. Conversely, with animals that are aggressive, he needs to interpret any signs, raising or lowering of tail, flexing of muscles, blowing, or salivation, etc., that indicate an attack rather than a flight. In many cases the animal is intentionally provoked to attack. The variations are innumerable.

One useful generalization of the problem faced by the hunter is that he wants to get as close as possible for the best possible shot, but he would rather have a poor shot than none at all. The enormous labour and skill that are expended in approaching the animal – often hours of lying on the ground waiting for a change in direction of wind or in the position of the animal – testify to the crucial importance of stalking.

The technological equipment of most primitive hunters is such that their quarry is usually shot at relatively short distance, usually less than 30 feet for harpoons, bows and arrows, and spears. This generalization about the minimum distance for the best shot must be qualified, because the hunter may want the maximum distance compatible with his weapon, in order to provide time for a second shot. Some animals tend to continue in the direction they were travelling after they are shot. Other animals have a tendency to simply stand and bleed, if not frightened by sight or smell of the hunter. The point here is simply the enormous range and complexity of animal behaviour; the influence of situational factors depending upon the time of day, sex, age, nutritional state, degree of excitation, the nearness of a mate or of young, etc. These factors must all be read into the decision-making machinery of the hunter.

Hunting with high-powered rifles and telescopic sights, and to a lesser extent, with modern archery equipment, is substantially different from the hunting of primitive man. In general, the better the technological equipment, the less intimate the knowledge of animal behaviour required. Getting close to an animal represents the major investment of the "primitive" hunter, and explains the extensive attention given to childhood programming and to the location of game.

Immobilization, Killing, and Capture

The vast majority of animals taken by "primitive" hunters are not killed outright, or are not killed upon initial contact. More often they are wounded, stunned, or immobilized to a degree that renders them incapable of rapid or prolonged flight. Even where poisons are employed, the larger mammals may live on, travelling slowly, for one or more days. The Pygmy elephant hunter does not expect his quarry to fall over immediately after the first puncture, but he does expect to be able to induce hemorrhaging that will impair the functioning of the elephant and simplify tracking. In other cases, the hunter intentionally avoids killing the animal for very practical reasons. An Eskimo may wound a bear and then drive him down to a stream where he can be killed and boated home. If inland on a small island, the Eskimo may wound the bear and walk him over to the edge of the island, then dispatch him and roll him into the sea, where he can be floated and towed away. In many such cases it is practical and highly desirable to save an enormous amount of labour, the back-packing of some 1,200 pounds through difficult country, by wounding the animal and heading him in the preferred direction.

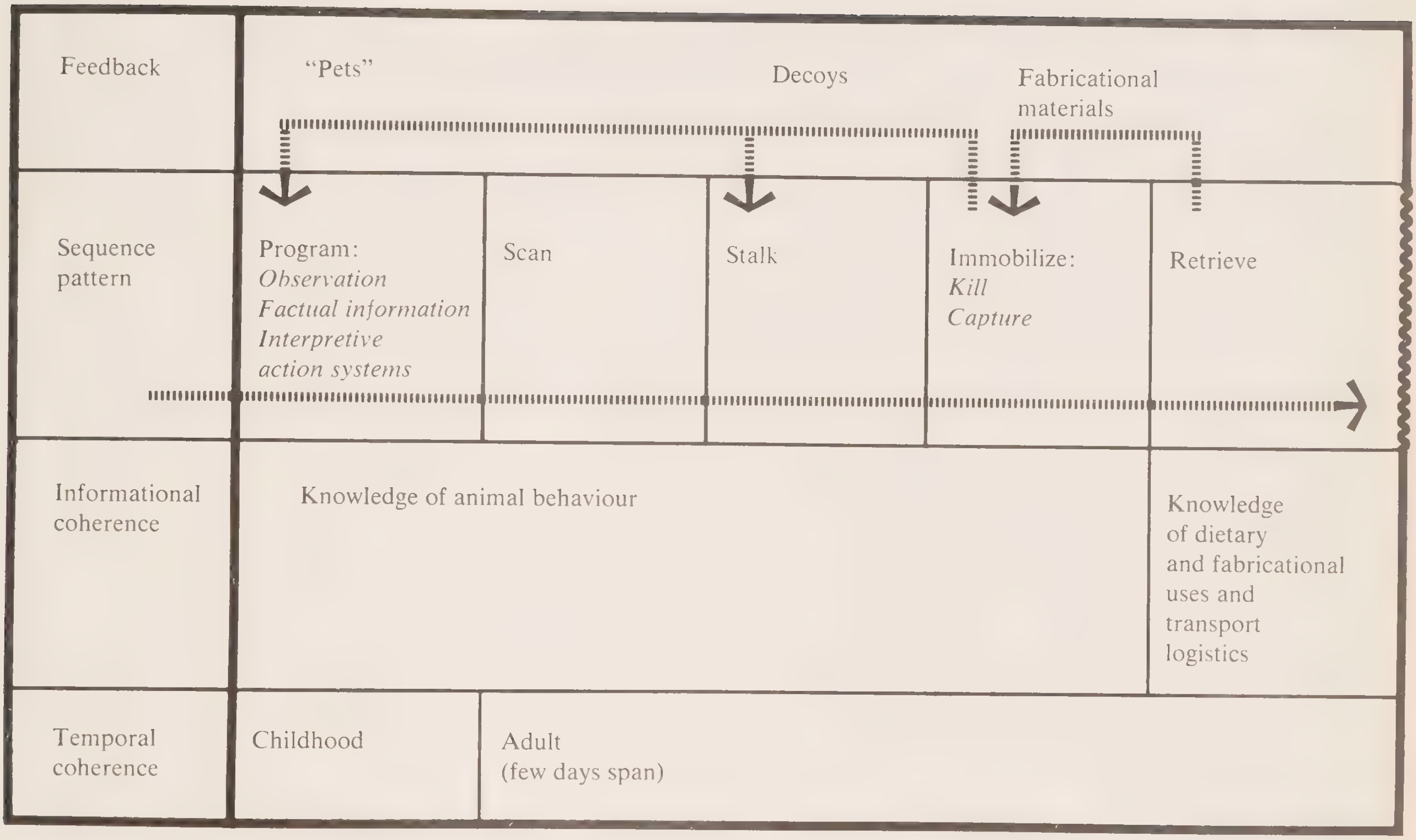
Capture of animals may be an objective and done for many different reasons. One important reason is the need to secure living specimens for study and child instruction, commonly categorized as "pets" in the literature. Live animals may be desired for decoys, or they may be used for various ritual purposes. Birds may be taken for training in hunting or fishing (cormorants, falcons, etc.), or simply kept as a source of feathers. From the enormous range of methods of taking the quarry it is obvious that immediate and outright killing is only one of many variations. The extensive use of snares, traps, and pitfalls testifies to the concern with capture rather than immediate killing.

Retrieval

Retrieval of game represents the end point of the hunting complex pattern, it is the object of that which has preceded it. Within the retrieval complex are included the immediate details of retrieving a floating seal or walrus, and of getting it secured to the kayak, or to an umiak, or an ice cake so that it can be cut up. Many items of material culture naturally fall in here, and retrieving hooks for securing floating animals before they sink are prominent among them. This complex includes the dressing and preparation of the animal for return to the camp or village. The activities involved in this complex extend to the distribution and use of the game, and ultimately, the return of some of the materials back into earlier portions of the sequence system. A flow chart shows the routes by which some of the materials return to participate again in the system (Figure 4). The most obvious is the capture of an animal to be used for instruction of children in animal behaviour. Thus, the entire system is activated in proper sequence and reverts to flow again into the system.

The intellectual requirements for appropriate behaviour in this stage of the system still depend in part upon the same prerequisites as the preceding four stages. However, there is a qualitative difference. An animal must be expertly drawn in accordance with its anatomy, its fabricational and nutritional uses, the size, which affects carrying it back to the camp, and the social factors, such as some desired portions – horns, tail, forward flipper, or fluke meat – for persons of relevant status. Attention shifts over to anatomy rather than behaviour, to material characteristics, and to fabricational and dietary

Figure 4
Process of hunting



qualities of the animal. Some portions may be eaten immediately, and others may be employed in a ritual observance to insure affability of the animal spirit. Hides are carefully removed if they are intended for fabricational use and are cut in accordance with a particular use. Thus, if a sealskin is to be used for a line, it must be slipped in tubular fashion off the carcass, so that a continuous, circumferentially spiral line can be cut. But if the seal is to be fed to dogs, or if the skin is to be used for clothing, or both, it is drawn quite differently. The same animal has different meanings for different peoples. These extend far beyond its rank order in the list of food preferences.

Women and dogs have been the principal beasts of burden since Paleolithic times. However, they are not universally available, as women are not always at the site of killing and butchering, and many people did not breed dogs suitable for packing. Where long distances and large amounts of meat are involved, a village may move to the animal. Elephants and whales, unless juvenile or easily floated, usually become community projects. It is interesting that, excepting the sled and dog traction, both comparatively recent, the only mechanical advantage accessible to "primitive" man was water transport. The retrieval flow pattern of the Eskimo or Aleut, who harpoons a seal, tows it home behind his kayak and eats all the meat, contrasted with the sledging Eskimo, who harpoons a seal, carries it home on a sled and then shares it with the dogs, is enormous.

The kayak-hunter can tow much greater weights more easily than can the sledgers. The kayak-hunter can use the skin of his quarry to make the kayak with which he hunts the beast. Marine hunters use more of the products of the animals they hunt than do terrestrial hunters, and they use them more advantageously. Esophagus, intestines and pericardia are of little use to most hunting groups as fabricational materials, yet they account for an appreciable part of the clothing of some northern peoples.

Simplicity of Basic Technology

The common weapons and related devices used in stalking and immobilization of game are basically simple and elementary. Over the million or more years in which man has evolved

as a hunter, it is probable that the vast majority of mammals, birds, and fish have been killed with clubs, stones, knives and spears, or simply strangled with the hands or in a snare or noose. Examination of the archeological record, even that of Upper Paleolithic big-game hunters, is not impressive except in virtuosity of flaking or in some artistic variations. Diagonal flaking of a spear point has no demonstrable advantage over parallel flaking, and fluting offers no discernible advantage over unfluted points.

As Boas observed, "as soon as a reasonably long shaft allowed an attack from a point beyond the reach of the teeth and paws of the animal, hunting became safer" (Boas 1938: 254). The spear, used as a lance or cast, was certainly a major step forward, and has persisted for hundreds of thousands of years. Nevertheless, it is basically a simple invention, and the spear-thrower, still in use by some Eskimos and Australian aborigines, is similarly an uncomplicated device. The bows and arrows in use by most "primitive" hunters were not impressive for their cast, distance, or accuracy. An examination of the variety of arrow releases and their geographical distribution (Wissler 1926: 30–40) serves to reinforce the idea that cultural styles, in construction and use of various tools and weapons, have only limited relevance to their potential efficiency. As previously suggested, the enormous variety of harpoon heads that have been used for the same species of seal, or the variety of fishhooks that are used to catch the same species of fish, illuminate the basic fact that the hunter invests more heavily in knowledge of the behaviour of the animals, and in methods for approaching them or attracting them close to him, than in increasing the range or impact of his weapons.

A substantial amount of hunting reveals the way in which animals can easily be approached under suitable conditions; and then dispatched with a club or a spear. Many animals are killed while asleep. Obviously the most ferocious beast in the world is utterly harmless while asleep or hibernating. Walruses, which are often victors in combat with polar or brown bears, are frequently taken while asleep. Screening noises are also prominently utilized in many forms of hunting. During storms, the sea otters haul up on shore. The Aleuts approach them with ease at this time, owing to the animals' inability to hear the approaching hunters, and simply club them (Elliott 1886: 142–143). To a significant extent, young animals fall in the same accessible category as sleeping animals. The archeological and ethnographic record is unambiguous on the fact that the vast majority of mammals killed are immature or subadult. This reflects the population profile of many species, but it also represents a preference on the part of the hunter. The largest and oldest animals are more difficult to kill or capture, they do not taste as good as younger ones, their hides are often scarred and therefore less desirable for clothing, and they may even be avoided for conservational and religious considerations.

Driving animals – into a net, a pit, over a cliff, or within the range of concealed hunters – is again simple so far as the technology is concerned. The coordination required of the persons conducting this part of the hunt is more complex. The signalling system used by Aleut and Koniag kayak hunters, when surrounding animals, reflects the solution to a problem in communication where spoken language would frustrate the combined efforts of the hunters. The position of the paddle of the first man to sight the quarry provides cues to the other hunters. The several methods that a group of hunters employ in scanning, stalking and killing place a premium upon precisely coordinated social organization, and reveals the importance of alternate forms of communication among the participants. Brief, silent, inconspicuous and unambiguous cues are absolutely necessary in such operations.

Though the technological sophistication of many poisons is considerably advanced beyond hand-ax or club, the use of poisons also illustrates that programming must precede the killing complex (Linné 1957). The development of effective poisons demonstrates the basic inventiveness of "primitive" hunters.

Among the great inventory of hunting technology is the ancient and widespread bolas. Like the bull-roarer sling and centrifuge, they are simple enough for women and children to manipulate and they contribute substantially to the hunting economy.

The point of emphasizing the simplicity of the basic technology is to draw attention to the sophistication of the complexes preceding the actual use of the weapons. In a very real sense, the hunter is taking a final examination with a mortal demerit for failure. It is the preceding period of learning that enables him to perform adequately.

Hunter's Sophisticated Knowledge of Behaviour and Anatomy

There is ample documentation, though surprisingly few systematic studies, for the postulate that "primitive" man is sophisticated in his knowledge of the natural world. This sophistication encompasses the entire macroscopic zoological world of mammals, marsupials, reptiles, birds, fish, insects and plants. Knowledge of tides and meteorological phenomena generally, astronomy, and other aspects of the natural world is also well developed among some "primitive" peoples. There are large variations between groups in sophistication, extent of knowledge, and the areas of knowledge in which they are specialized. Empiricism is not at all uncommon, and inventiveness similarly recurs in widely separated peoples with only remote or indiscernible historical connections. Having previously discussed these topics (Laughlin 1961, 1963), I will

only cite the relevance of this sophistication to the hunting behaviour system.

Hunters are extremely knowledgeable about animal behaviour and anatomy for a variety of reasons. Hunting is their profession and it requires such knowledge. They recite events of hunting, they endlessly discuss the weather and its effects on ice conditions or on the moss on which caribou feed. They make predictions on the numbers or kinds of animals, based on weather conditions and its effects on animals and plants that serve as food for carnivores and grazers. Their conversations often sound like a classroom discussion of ecology, of food chains and trophic levels.

The accuracy of their information is attested by their success in hunting, and by comparisons with scientific studies of behaviour and anatomy and systematics. In discussing the species concept of the local naturalist, Ernst Mayr wrote:

> Some 30 years ago I spent several months with a tribe of superb woodsmen and hunters in the Arfak Mountains of New Guinea. They had 136 different vernacular names for the 137 species of birds that occurred in the area, confusing only two species. It is not, of course, pure coincidence that these primitive woodsmen arrive at the same conclusion as the museum taxonomists, but an indication that both groups of observers deal with the same arbitrary discontinuities of nature. (1963: 17)

The consultation of native hunters by naturalists extends well back into the 19th century. The naturalist Chamisso who visited Unalaska as early as 1817 published a detailed study of whales, in which he depended upon the local Aleuts who carved wooden models of each of the whales and provided varied information about each (Chamisso 1824).

The ubiquity of sophisticated information among hunters is probably of more importance for interpreting the development and consequences of such information, than the unusual and rare achievements that may occasionally be associated with such knowledge. The preparation of mummies and intentional autopsy of the dead to find out why they died are expectable developments where there is the appropriate context and concern.

The Tungus, described in detail by Shirokogorov (1935), compare favourably with Eskimos, and even with the Aleuts (Marsh and Laughlin 1956). They are good gross anatomists, their ideas on physiological functions are based on their observations, they are good naturalists, and they are concerned to acquaint themselves with the behaviour and the anatomy of animals or birds not well known to them. They capture live specimens for this specific purpose and for pets, for the instruction of children. "He [the Tungu] is interested in the comparative study of bones and soft parts of the body and he comes to form a good idea as to the anatomical similarities and dissimilarities in animals and even man" (Shirokogorov 1935: 73).

As previously indicated, the sources of Aleut anatomical knowledge can be divided into five categories: (a) the study of anatomical structures; (b) a rational medicine and physical culture; (c) dissection of human bodies; (d) true comparative anatomy, focussed on the sea otter; and (e) the manufacture of dried mummies (Laughlin 1961: 157–160). The first, second, and fourth categories appear most ubiquitous. The daily butchering and drawing of animals leads to knowledge about them, and to the extent that internal tissues are used for food or fabricational purposes, the knowledge may be considerably detailed. Hunters are well aware of the affinity between man and other animals, and they all have relevant exercises designed to condition the hunter. A good deal of information on human biology is inevitably obtained first from the need of assistance or intervention at birth.

Conclusions and Summary

The overall evolutionary efficacy of hunting as a master integrating pattern of our species is illustrated in many ways. Man has successfully evolved with a simple technology over hundreds of thousands of years; he migrated into all the continents and climes; he solved all the local problems of adaptation with ingenuity and inventiveness. These feats are climaxed by the relative rapidity with which he developed civilizations and, equally important, by the fact that the hunter was converted to the civilized man independently in different continents. He was obviously preadapted and even predisposed to civilization.

The inherent ingenuity of "primitive" hunters, can be attested by citing inventions. Two points of interest result: the inventions listed are confined almost entirely to material devices; and some peoples have been more inventive than is generally appreciated. The kayak with three-piece keelson of the Aleuts, the snow dome house of the Arctic Eskimos, the double-purchase pulley, screw-thread, slit goggle, visor, three-legged stool, etc., of the Aleut-Eskimo stock is matched only by their development of human anatomical knowledge, their knowledge of natural phenomena including animal behaviour, and their systems of navigation on sea and land. Although goggles and stools are well known, the non-material inventions are not. The material things remain clever devices until the intellectual context of their invention and use is comprehended. Where primitive hunters have not invented material devices that capture the attention of observers they are less often credited with inventiveness, and their knowledge in those areas in which they invested time and interest is underestimated.

In the final analysis we return to the informational requirements of the hunting system for the development of the individual. Hunting must be learned by children. The children

must learn by participation in the habit of critical observation of animal behaviour and appropriate responses to it. It is insufficient to tell children about animal behaviour and anatomy. It must be programmed into them in a far more integrated fashion. A corollary point which clearly applies to hunting groups and their history is that a simple technology does not indicate simple mindedness. We know a good deal about the magnitude of the task accomplished with simple tools in the hundreds of thousands of years of successful human evolution. We know, therefore, that the major information investment went into the nervous system and the non-material aspects of the highly adaptive hunting cultures.

References

Boas, Franz
1938 Invention. In *General Anthropology,* Franz Boas *et al.* (editors). D. C. Health, Boston and London.

Chamisso, Adelbertus de
1824 Cetaceorum maris Kamtschatici imagines, ab Aleutis e ligno fictas, adumbravit recensuitque. *Verhandlungen der Kaiserlichen Leopoldnisch–Carolinischen Akademie der Naturforscher,* 4 (1): 249–262 (Nova Acta 12, part 1). Breslau and Bonn.

Elliott, Henry W.
1886 *Our Arctic province: Alaska and the Seal Islands.* Scribner, New York.

Hallowell, A. Irving
1960 Ojibwa ontology, behaviour, and world view. In *Culture in history: essays in honor of Paul Radin.* Stanley Diamond (editor). Columbia University Press, New York.

Heizer, Robert F.
1960 The Aleut sea otter hunt in the late nineteenth century. *Anthropological Papers of the University of Alaska,* 8 (2): 131–135.

Laughlin, William S.
1961 Acquisition of anatomical knowledge by ancient man. In *Social life of early man.* S. L. Washburn (editor). Aldine, Chicago.
1963 Primitive theory of medicine: empirical knowledge. In *Man's image in medicine and anthropology.* Iago Galdson (editor). Institute of Social and Historic Medicine, Monograph 4: 116–140. New York.
1967 Human migration and permanent occupation in the Bering Sea area. In *The Bering land bridge.* D. M. Hopkins (editor). Stanford University Press, Stanford.

Linné, Sigvald
1957 Technical secrets of American Indians. *Journal of the Royal Anthropological Institute of Great Britain and Ireland,* 87 (2): 149–164.

Marsh, Gordon H.
1954 A comparative survey of Eskimo-Aleut religion. *Anthropological Papers of the University of Alaska,* 3 (1): 21–36.

Marsh, Gordon H., and William S. Laughlin
1956 Human anatomical knowledge among the Aleutian Islanders. *Southwestern Journal of Anthropology,* 12 (1): 38–78.

Mayr, Ernst
1963 *Animal Species and Evolution*. Harvard University Press, Cambridge, Mass.

Nelson, Richard K.
1966 *Alaskan Eskimo exploitation of the sea-ice environment*. Technical Notes, AALTR-65-19. U.S. Arctic Aeromedical Laboratory, Fort Wainwright, Alaska.

Rasmussen, Knud
1929 Intellectual culture of the Hudson Bay Eskimo, I: intellectual culture of the Iglulik Eskimos. *Report of the Fifth Thule Expedition, 1921–24*, VII (1). Copenhagen.

Shirokogorov, S. M.
1935 *Psychomental complex of the Tungus*. Kegan Paul, Trench, Trubner, London.

Wissler, Clark
1926 *The relation of nature to man in aboriginal America*. Oxford University Press, New York.

The Inuk as a Hunter*

by Richard K. Nelson**

One of the most overwhelming and lasting impressions that one receives of the Eskimo hunter is that he is self-assured and competent above all. What are the qualities which give this impression of competence?

First, and most important, the Eskimo hunter is knowledgeable about every aspect of the environment which he exploits. This body of knowledge goes far beyond that which is essential for success in basic travel and subsistence activities, to include a large number of facts relating to unusual or rare occurrences, such as emergency conditions. Each Eskimo hunter is faced with an "emergency situation" of one sort or another during almost every season of every year, and he must draw upon this specialized factual background in order to make the correct responses. With this background, most of these situations are so aptly responded to that they can hardly be called actual emergencies; nor are they considered so by the hunter.

The Eskimos are traditionally concerned with knowing as much as possible, and individuals are given special respect and prestige if they are especially knowledgeable. Thus they are willing and anxious to learn from their fellows, both by watching them as they hunt and by listening as they recount their experiences or relate what they have heard from others. A great deal of time is spent discussing all aspects of the hunt, especially during the long idle nights of winter. In addition to watching and listening to others, the Eskimo hunter is highly observant of his surroundings and of his own experiences. These personal observations are always passed on to the others in later conversations, and thus the cumulative knowledge of the group is constantly being enlarged and improved.

Unlike the westerners with whom he has contact in modern times, the Eskimo seldom doubts what he has been told by others, especially if they are his elders. Thus, without previous actual experience in a given situation he will unquestioningly respond to it in the way that he has been told. The outsider, on the other hand, continually frustrates the Eskimo by doubting these instructions and attempting to formulate original solutions which he believes to be better. Those who live with Eskimos over a long enough period find themselves questioning less and less, and following whatever they are told to do by their more experienced native companions.

The Eskimo hunter is, therefore, uncommonly self-assured about his knowledge as well as his ability to cope with any situation. He is confident that whatever he has been told is true, and if he follows what he has learned, he is almost always doing the correct thing. It is my opinion that information given by Eskimos relating to successful hunting or survival techniques is nearly always correct and well founded, regardless of how difficult it may be to accept initially.

If the Eskimo is self-assured in his background of knowledge, he is equally confident of his physical competence and his ability to persevere in the completion of any task. This perseverance, both mental and physical, is a second important attitude which we should briefly consider.

The active Eskimo hunter is usually in excellent physical condition, as one would expect him to be. Thus he is able to perform difficult tasks over long periods of time with a minimum of discomfort. In addition to this physical stamina there is another quality which is as much mental as physical and which might be called "toughness". The Eskimo views prolonged exposure to cold, wetness, or extreme physical exertion with a different frame of mind than most non-Eskimos, and seems much less affected by it.

This ability to withstand physical discomfort often makes the Eskimo vastly superior to the white man in strenuous situations, because he is not so concerned with remaining perfectly comfortable at all times. He does not feel compelled to carry as much gear and clothing when he travels, which lightens the load and leaves more space for transportation of game. He carries whatever equipment he would require in an emergency, but bothers with few unnecessary items. This is especially true in the cold months of the year, and it is less closely followed during the relatively easy summer months.

The Eskimo also perseveres at almost any task until it is successfully completed. He is not likely to give up and become unhappy if conditions are difficult. Eskimos seldom turn back once they have set out, regardless of how tough the going may become. But they are wise and prudent enough not to begin travelling if there is much danger involved. They are seldom anything but thorough in the completion of a task, for they realize that if the job is not done fully, it may well cause more work in the long run.

For example, if the tide is rising and the boats should be pulled higher up on the beach, they will be pulled to the very top of the beach where even the highest storm tide would not reach them. In no case will they be pulled only part way up, where they might be caught later if an unexpected gale begins to blow. If a man shoots a seal, he will sometimes stand for one or two hours attempting to snag it with a retrieval hook. Or if 10 walruses are shot, then no less than 10 walruses will be brought home, regardless of how much work and time must be expended, as long as there is not a great risk involved. In these and many other ways the Eskimo perseveres far beyond what would be expected of an outsider.

But although the Eskimo is perseverant in most tasks, he is also wise in the expenditure of energy, because energy is a valuable commodity here. In the completion of a task, whether or not it requires much strength, the best job is done with a minimum of unnecessary steps. Eskimos are experts at finding shortcuts in labour expenditure, as for example in moving through rough ice, where the best travellers stop and reconnoiter frequently in order to follow the smoothest trail. This

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always involves traversing a much greater distance, but in the long run much less energy is used by avoiding rough ice areas. Another example is seen in spring seal hunting, where the men go out on foot and push dogsleds ahead of them. They do this because they realize that killed seals are very difficult to drag on spring ice, and less energy is expended by pushing a sled both ways than by having an easy walk out but working much harder pulling the seal home.

This brings up another characteristic of Eskimo mental attitudes, that of foresight. Although foresight is not demonstrated in all realms and all activities, it is usually important in hunting and in any situation of immediate potential danger. Thus they will not travel out onto the sea ice in winter if there is any chance of being set adrift on a loose floe. They also pass by herds of walruses which are in thick pack ice, where the crew might be trapped after an hour or two of butchering, if the ice should close around them. And they will not take unnecessary chances or "fool around" under any circumstances, as exemplified by the fact that none has ever demonstrated to me the method of walking on thin ice, except on a completely safe surface. The Eskimos seem to have an unspoken concept of "percentage risk". Thus a certain activity might be done without danger eight out of 10 times, but because of this 20 per cent risk the Eskimo seldom carries on the activity as long as it can be avoided. It seems that the western idea of doing things for the excitement of taking a chance rarely occurs here.

Although he seldom willingly faces danger, the Eskimo is extremely alert for unexpected situations, as well as for signs of game. Whenever he hunts or travels, he does not permit himself to become completely distracted by one activity, but is constantly on the watch for any change in his surroundings. Thus, no matter how intent he may be on stalking a seal lying on the ice, he still glances around the area in case a polar bear might be near, and he watches the surrounding ice lest it should begin to move and carry him away from the landfast ice. When crews of men are engaged in butchering walrus on an ice pan, they frequently look up and flash their eyes over the surrounding water in case a seal should surface nearby. And should they see one, they move with amazing speed to grasp their rifles and shoot, knowing that the first chance is always best and often there is no second chance. Their secret is to avoid becoming too engrossed in what they are doing. One who hunts with them will find that for some time he will be too slow and deliberate, and hence will rarely get off a shot before the Eskimos do. Finally, some of the alertness and quickness is acquired, and it is a considerable advantage in getting along successfully. A measure of this sort of alertness could mean a life saved in an emergency as easily as in everyday life it means a seal brought home that might have gotten away.

Besides being constantly alert, the Eskimo hunter uses his abilities of imaginativeness and creativity to the utmost. Where there are no repair shops, specialists, or large general stores, it is frequently necessary to resort to improvisation in order to make or repair an item of equipment. Some of these improvisations are "standard" in the sense that they are done on repeated occasions when the same situation arises. In many instances, however, it is a unique problem and an entirely new solution must be devised. Having found it necessary to face these situations many times in their lives, the Eskimos are experienced and highly adept at this sort of creative thinking. Outsiders are seldom as quick and clever in devising solutions to these problems.

In situations where needed materials are not at hand, one must attempt to push his imagination beyond its usual limits. Outsiders often do not see an obvious solution as a feasible one, because they simply assume that it is impossible to deviate so far from convention with any hope of success; or they resign themselves that the situation is hopeless. An Eskimo will never do this. A familiar example from the literature is making an emergency sled from pieces of frozen meat. When the cross hairs of a telescopic sight are broken, they can be replaced on the spot with thin strands of dental floss (which is carried for sewing); or when a hole is torn in the skin cover of a boat, a small board can be quickly nailed over it as an effective repair. Non-essential pieces taken from other equipment are often used for improvisation. An iron rod from the grid of a camp stove can be removed and used to clear the barrel of a jammed rifle, or shaped into a serviceable gaff hook. One who has not grown up to think in this way will not equal the Eskimos, but it is easy to improve one's own ability markedly by forgetting about conventional solutions and allowing one's inventive imagination greater freedom.

Cooperativeness in hunting and travelling is an aspect of Eskimo life which has been discussed time and again. It has long been necessary for these people to work together and share the proceeds of their efforts, both large and small. Thus no man is ever left to retrieve a seal by himself when he is using a small retrieval boat. Someone will always come to assist him, whether or not he could do the job alone. For assistance rendered there is not expectation of immediate remuneration or expressed gratitude, but every man knows that someday in the future he will receive "payment" in kind.

Similarly, crews join together in groups to hunt walruses, so that the net kill is larger, the work proceeds faster, and equipment can be pooled. Then the spoils are divided among the crews so that all receive shares, even if they did not participate in the actual shooting. Sometimes a small group of men will encounter a localized concentration of game, such as a large herd of caribou or a school of belugas which has been trapped at an air hole by closing ice. When this happens, they may shoot a few animals, but then they will hurry to the village to get more hunters. Although several men could get more for themselves by remaining there and shooting alone,

the total proceeds for the village are greater if they take the time to go after the others.

In the same way, emergency situations are always met with group effort. Certainly there would be no concept of "every man (or every crew) for himself". On one occasion a walrus hunting crew had outboard motor failure and were loaned an engine by a passing crew that happened to have an extra. For the lending party there was no promise of immediate compensation for its assistance, but at some future date they might require some sort of aid and it would, of course, be returned. This kind of ability to cooperate is essential for life in this environment and could be especially important in emergency situations.

Sharing proceeds of the hunt or giving assistance is so much a part of this way of life that there is an entirely different notion of obligation and reciprocity. Whereas the non-Eskimo expects verbal thanks or material compensation when he has given something, the Eskimo has no such expectation. Misunderstandings between individuals of the two cultures are likely to arise because of this difference in custom. When the Eskimo expresses thanks for a gift, it is usually an affectation brought about by acculturation. If he feels gratitude in such a situation, it is usually not indicated by any overt expression. We mention this as an item of interest, not as an implication that such an attitude is necessarily adaptive.

The white man could learn a valuable lesson by observing the ways in which Eskimos avoid conflict in small groups with intense interpersonal contact. This sort of conflict is quick to arise in small groups, especially under dangerous conditions. Eskimos have learned not to disagree with one another openly or to issue orders to one another, qualities which are helpful in the avoidance of conflict. Whites, on the other hand, are notorious for becoming aggressive when small groups are confined for long periods.

We might illustrate this with a couple of examples. In the umiak crew, one experienced and active hunter usually takes charge of the boat. He decides where to go (with the aid of discussion among the others) and when to camp or return home. But regarding the actions and movements of other members of the crew, he has little to say. One man seldom tells another what to do. If a young hunter walks out onto the ice in summer without pushing a sled along, those who know better will probably let him shoot a seal and learn for himself how difficult it is to drag the seal home on the ice without a sled. Only in a dangerous situation will comments or hints be made, and even then they are often cryptic and indirect. Minding one's own business reaches extremes on occasion. I once saw two puppies pull an excellent caribou skin down from a cache and rip it to shreds, in full view of several Eskimos. It is better not to interfere in another man's affairs at all than to risk offending him, even in situations like this.

There is one other attitude of the Eskimo which seems to be adapted to his economic life. This is his ability to find genuine humour in misfortunes that befall him, or in his own errors. It is sometimes explicitly stated that a hunter should laugh when things go wrong, because anger never helps, while laughter makes him better able to overcome setbacks. In an environment where so much can go wrong, and it is so easy to lose something that has nearly been gained, such an attitude is almost a necessity. If a hunter has shot a bearded seal, and when the harpoon is tossed it glances off just as the animal sinks, this is an occasion for laughter, not for disgust. The old hunter, Kavik, never tired of telling stories of his exploits, and he would sometimes laugh until tears glistened in his eyes when he told of his greatest and most frustrating mistakes.

The following story is intended to illustrate some of the statements we have made above, especially those relating to the knowledge, ingenuity, and perseverance of the Eskimo. Titalik, who told this story of his own experience, had a long trap line north of Wainwright. One day he came across the tracks of two wolverines that had investigated the bait near a trap but had stayed at a safe distance. The snow was fresh, and they left a clear trail off across the tundra. So Titalik began following them with his dog-team, knowing from the tracks that they could not be far ahead.

After a short time the dogs suddenly quickened their pace with excitement. Titalik saw something black outlined against the snow, which he recognized as a wolverine. He took off his mittens and put on a pair of gloves so that he could shoot, but when he looked up again the animal had disappeared. He urged the dogs ahead, and suddenly they stopped, sniffing at a hole leading down into the snow.

After inspecting the hole he decided to try digging the animals out, using the shovel he often carried with him. After a while he dug down through the snow and struck the rock-hard tundra below. A large hole ran deep into the ground, its opening wide enough to admit his head. He could detect nothing inside. He needed a light and a long pole, but he had neither. At this point anyone but an Eskimo would have given up, because certainly there was no way to coax the animal out from its lair. But Titalik was just getting started.

There was no brush or scrap wood around with which he might have probed the hole, but his sled was made from wood, and in his equipment bag he had a hammer. He removed two cross pieces from the upstanders and one long strip of wood from the top edge of the sled. All three were fastened together to make a pole about 15 feet long. He now had something with which to probe the hole.

He lay prone in the opening and slowly thrust the pole deep inside. After some moments it nudged a soft body. A low growl was heard and something snapped at the pole. He poked the animal repeatedly, trying to torment it until it would come out, but it did not move. Finally he went to his sled for his rifle. He had no way of seeing inside the hole, but he could aim along the pole for some indication of where to shoot. After many shots, he could hear the wolverine breathing

heavily, and he knew that a bullet had struck it. He shot again, and finally as he lay prone in the opening, he felt the pole begin to push out toward him.

In a flash he jumped away and stood on a small ledge that he had shaped in the snow above the hole. After a few moments the dark head of a wolverine emerged beneath him. He killed it with a single shot. But he did not move yet, because he had an idea of what might happen next. After another wait the carcass began to move a bit, and alongside it a second wolverine stuck out its head. He shot this one also.

We have attempted to show some of the ways in which Eskimo attitudes or personal qualities are adapted to their environment and economy. This is not meant to show that Eskimo personality is superior to others, except that it indicates better adaptation to particular situations with which others are seldom faced. Also, many examples could be given of deviations from these ideal modes of personality, for as in any culture, these frequently occur. We have discussed here some subjective evaluations of the idea pattern, and the ways in which it is manifested in actual behaviour.

It is felt that these patterns of personality, like many of the techniques and processes which we have described throughout this book, may have parallels in similar ecological situations elsewhere. All these aspects of the Eskimo sea ice adaptation could be used by members of any culture who might face such conditions anywhere on the earth. After more than a century of "teaching" the Eskimo to live like ourselves, we should now turn about and ask what we may learn from him, as our culture spreads farther and farther over the domain of his ancestors.

The Inuk as Trapper: A Case Study*

by Peter J. Usher**

Introduction

For most northerners in Canada, fur trapping has for generations been the main source of cash and trade goods. Recently this traditional occupation has declined in its ability to support the people engaged in it. Few other economic opportunities have arisen to take the place of trapping, unfortunately, and seldom have trapping communities been afforded an easy transition into a new life. There are exceptions to this rather dismal picture of trapping and of modern life in northern native communities. The most remarkable of these is the case of Banks Island, Northwest Territories, where a small group of trappers continue to lead a productive, satisfying and self-sufficient life. There the Eskimos colonized new trapping grounds, and developed trapping practices to an unprecedented degree of modernity and productivity. Since 1929 the island has become the most productive white fox trapping area in the New World.

The Origins of the Arctic Fur Trade

The Banks Island community, though geographically isolated and relatively inaccessible, cannot be understood without reference to the social and economic realities of the nation, and indeed the world. No community is a closed system, even in the Arctic; least of all Sachs Harbour which is totally dependent on outside markets for its produce and on outside sources for the means of production and of life.

The white fox trade had its beginnings in the last days of the whale fishery, in both the eastern and western Arctic. The establishment of the Cape Wolstenholme, Quebec, post in 1909 marked the real beginning of the Hudson's Bay Company Arctic trade, for although they had regularly sailed through Hudson Strait for 240 years they had never exploited its shores. The expansion of the trade was extremely rapid; the network of posts and the induction of the Eskimos into the trapping and trading system being virtually completed within 15 years. Although "The Bay" spearheaded this thrust, it was everywhere faced with competition both from large trading concerns and individual entrepreneurs. The Eskimo experience was thus quite different from that of the Indian, due to its much later and much more rapid development and, particularly in the western Arctic, because the fur trade was fiercely competitive from the very beginning.

Two immediate results of this flurry of activity were the decimation of native populations through disease, and the destruction of their major food resources, especially the caribou. Unlike the Indian experience, where severe depredation of the fur-bearers themselves occurred, there was probably never any widespread over-harvesting of the white fox.

The Depression ruined most of the free traders and even the larger trading concerns, and by World War Two, the Hudson's Bay Company had overcome most of its competition. The total number of posts in operation in the north had declined greatly, and the future pattern of settlement, based on the established fur trade centres, was well established. The monopolistic position of the Hudson's Bay Company in the Arctic thus dates only from the late 1930's.

The end of the traditional fur trade era came with the declining fox prices and the resulting Arctic-wide depression of the late 1940's. This was a time of severe hardship, and by comparison the Eskimos had come through the Great Depression of the previous decade unscathed. Although fox prices improved subsequently, increased opportunities for wage employment after 1955 proved both the immediate salvation and the subsequent (although still inadequate) basis of the Arctic economy. As the fur trade waned, and alternative sources of income became available to the Eskimos, in 1959 the Fur Trade Department of the Hudson's Bay Company changed its name, significantly, to the Northern Stores Development.

The Northern Trapper Today

The northern trapper lives typically in a small isolated rural community, and is almost invariably non-white. Most trappers are members of what is now fashionably called the subculture of poverty. Characteristically, the trapper must supplement or even obtain the bulk of his income from alternative economic pursuits. The main causes of poverty in trapping communities are a declining or static resource base, declining prices paid to producers, an increase in the number of producers, and the high cost of trapping. The centralization of people into a few large communities has often led to the local over-exploitation of the fur resource, but also to its under-utilization in the distant hinterlands. Often the trapper is under-capitalized. His income is intermittent, due to the seasonality of trapping, and unpredictable due both to the biology of the resources and to uncertainties of price.

During the course of a man's trapping career, he saves very little money in the normal sense. Surpluses are used to build up the stock of capital goods, to build, improve and expand the family dwelling, and to purchase or replace major household appliances and furniture. If the trapper is about 25 years old at the birth of his first son, he will have an apprentice and assistant to help him on the trail when he is 40. Many trappers see this as potentially the peak of their career – a

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time when they are still strong and healthy, and in a position to reap the benefit of accumulated knowledge and skill, a good stock of equipment and the energies of a young son still part of the family. Five or 10 years later, the son will be on his own, and if he still traps in partnership with his father it will be as an equal, at least in the sense that neither the productive equipment nor the proceeds of the venture are shared. As the old man slows down, he can no longer handle all the equipment, and so passes some on to his son who needs it to get a start. Since the older man's trapping life is now not much longer than that of this equipment, what is left is allowed to depreciate. To some extent this is true of the house and furnishings as well. The son may live at home immediately after marriage but will want to build his own house long before he can inherit his parents'.

Thus, when a man dies, it is rare that his estate can be converted into cash. He most certainly has no cash or liquid assets, and will have long since used up any credit he may have had with storekeepers or auction houses. He may have a house, furnishings and a modest stock of capital equipment, but all are distinctly second-hand, and since they either cannot be transported out of the community or are not worth it, the only market for them is the very restricted local one. Such an inheritance has little other than sentimental value to the children.

The result is that every generation of trappers starts virtually from the beginning in terms of physical assets. The trappers' legacy lies in how well he teaches his son to trap and hunt, to survive on the tundra, to be a strong, self-reliant and proud individual. The intangible legacy can be priceless, the physical one is often valueless. Unlike the family farm or family business, where cleared land, livestock, machinery, buildings, inventories and customer goodwill can be passed on, capitalization in trapping, although high, depreciates so rapidly that nothing remains at the end of a career. Not surprisingly this contributes to a much less stable situation with regard to the maintenance of the family enterprise through generations. Since the sons start virtually afresh, there is no opportunity cost for failing to trap, should more attractive alternatives be available.

The Bankslanders as Trappers

A remarkable proportion of Canada's white fox production is supplied by a mere 15 to 20 trappers on Banks Island. There seems little doubt that the top Banksland trappers are presently the best white fox trappers in the world. The individual catches of the leading trappers often exceed 500 foxes in good years. The record individual catch on Banks Island is 941 pelts, made in 1966–1967, and so far as is known this is a world record (however, see Postscript).

This success is due to modern equipment and methods used, and to the skill and hard work of the trappers. Steel traps are used exclusively: deadfalls and snares are unknown today. Some of the best trappers run 800 to 1,000 traps on lines up to 300 miles long. Some Eskimo trappers at Read Island, and a few white trappers on the mainland, used to run comparable lines, but they are no longer active. Although a few trappers in other parts of the Canadian Arctic also run long lines, they do not place nearly as many traps on them.

The Bankslanders not only run long lines with many traps, but these are checked frequently and carefully. Six or seven trips a year of two weeks each are typical. Accounts of trapping elsewhere again indicate that other trappers usually spend less time on the trail, and accordingly, loss ratios of trapped foxes are higher. Skill and knowledge cannot be so easily measured and compared, but there is little doubt that the Bankslanders are outstanding in this regard as well. Most important is the orientation and motivation to the trapping life, and no people have a stronger tradition of trapping than the Bankslanders. The system of Arctic fox trapping discussed below is the most highly developed and successful one in the world.

The Development of a Trapping Elite

The idea that the best Eskimo trappers were either the children or the apprentices of white trappers has gained some currency. Although this is no doubt partly true, the actual connection is more subtle. Most whites, upon their arrival in the Arctic, knew no more about trapping white foxes than did the Eskimos. Although they introduced the basic technology (in particular the steel trap), a knowledge of white fox distribution, abundance and habits was equally necessary, and in this regard the Eskimos certainly had the advantage. What the white man did bring with him was the motivation to trap, and this he passed on to the Eskimos in varying degree, through having already enlisted them in the market economy in the whaling days, or through his presence as trapper in certain areas.

In the early days, Eskimo and white trappers learned simultaneously: sometimes independently, sometimes together, certainly with some cross-fertilization of knowledge through discussion and observation. The learning process in trapping continues throughout one's career. Today, even the best Eskimo trappers are still learning, but from experience only.

The Arctic Fox on Banks Island

The chief fur-bearer on Banks Island is the Arctic fox. As in most other parts of the circumpolar region, the white phase predominates; indeed, the blue phase accounts for less than one per cent of the Banks Island catch. Red foxes, which are rare on the Arctic islands, are obtained very infrequently. Ermines are common to Banks Island, and are occasionally taken in the traps. Since these other species customarily account for about one tenth of one per cent of the catch, the present discussion is restricted to the Arctic fox.

Empirically, it is known that Banks Islands is capable of yielding very high fox catches, and that these catches fluctuate very markedly from one year to another. The very best trapping seasons on the island have produced harvests of 7,000 to over 11,000 foxes; such harvests compare favourably with the returns from other parts of the Arctic, and are remarkable in view of the small number of trappers involved. It is true that these trappers have expended more than the usual hundreds of miles of trap lines over an area of as much as 10,000 square miles.

Arctic foxes den in sandy, well drained, vegetated areas, particularly in stream banks and valley sides, preferably with southern exposure and an adequate water supply nearby. Unstable soils characterized by sorting and solifluction are avoided for denning, whereas hummocky ground with *Dryas* or lichens, or grassy knolls are frequently ideal. Such conditions are wide spread in the lowlands of western and central Banks Island, and it is possible that the area supports one of the densest populations of Arctic fox in the North American Arctic.

The trappers themselves very soon learned that the lowland province offered both fox abundance and ease of travel. Almost 90 per cent of the current (1961–1967) trapping area, and virtually all of the intensively used area, lie within this province.

The accounts of trappers (and of many Russian biologists) indicate that foxes tend to move down river valleys and along coasts. It is hardly coincidental that trappers tend to favour such areas. Fully 60 per cent of the trap line mileage lies along the coast or in the main valleys. It will be recalled that the valley sides are likely the best fox habitat in addition to providing natural route-ways for both the fox and the trapper.

If there is anything the Bankslanders are certain of it is that foxes move, even migrate, over great distances. There has never been any mass tagging of Arctic foxes in the Canadian Arctic, let alone on Banks Island, and we are again without direct evidence on this exceedingly important question. The trappers' theories about runs and migrations are inferred from circumstantial evidence. Many tracks in one direction, or a sudden catch (especially on the return trip) on trap lines previously thought "dead", are indications of significant movement, but how far such animals are travelling, and whether they maintain their apparent direction over long distances, simply cannot be known. Foxes caught inland with seal blubber stains around their mouths indicate they must have come from the floe edge; from which direction and at what time is again problematic. Many such occurrences suggest certain patterns of movement. Until better information is available, it would be ill-advised to reject the trappers' belief out of hand.

The Bankslanders believe that there is a basic seasonal movement of foxes. After freeze-up, some foxes begin to move off the land and on to the sea ice, where they spend most of the winter. In late winter, these foxes return to the land again to begin the breeding cycle. Reports of "runs" are most frequent before Christmas, when the trappers say the foxes move north and west (at least in south central Banks Island), and during the last month of winter, when foxes begin to move inland. Blubber-stained foxes have been trapped over 60 miles from the nearest coast, chiefly in spring.

In very poor years, the trappers depend on heavy spring runs, which are interpreted as the beginning of an upturn in the cycle. In average years, it is expected that caches will be somewhat better in the early and late parts of the season, with the low point coming after Christmas during the coldest months of the year. In peak years, the pre-Christmas abundance of foxes is explained by the large numbers of young foxes believed to be present, and there is indeed an above average occurrence of immature "bluebacks". A noticeable decline in total abundance after Christmas is expected. In the year following, the trappers believe that a good number of the previous season's foxes are still on the island in the fall, but depart with the onset of winter, resulting in a good catch on the first trip but a decline thereafter. Such a pattern was predicted by many of the trappers in the spring of 1967, and subsequent returns show that this was indeed the case.

In addition, the trappers believe that there occasionally occur movements of great magnititude and distance, and these are associated with population maxima. Not all maxima are the result of migration waves, for in the occasional winter, very little movement is observed, and this is attributed to a continuing abundance of lemmings during the winter. In such cases, even the normal seasonal migration fails to develop. It is then possible to move one's trap line a few miles to the side and start getting foxes again; indeed this is necessary for good results, since once the initial line is trapped out, one cannot depend on late season runs. There are still other years, however, in which high catches are attributed to migrations of more striking proportions. These are thought to be associated with sudden lemming declines which are synchronous over fairly wide areas, and at such times foxes are said to be coming from Victoria Island or even further.

Soviet observations of fox movements are certainly congruent with those made by trappers on Banks Island, and suggest that there may indeed be a seasonal migration pattern

there. Both the trappers' observations and the monthly distribution of the catch can be explained by the existence of a resident Banks Island fox population, of which some age classes, particularly the adults, move seasonally to and from their breeding grounds. Low midwinter catches may be due to the absence of part of the population, while the spring "run" is the result of the return to inland to breed.

The Fur Trade Era

Winter Camp Locations

The first group of trappers, coming to Banks Island in 1928, utilized the Canadian Arctic Expedition sod huts and the remnants of the *Mary Sachs* for their winter dwellings. The site was never again used as a winter encampment, presumably because it was discovered that Sachs Harbour, a few miles to the east, provided a much better site.

In subsequent years, more and more sites were investigated and used as winter camps.

The dispersal of camps seems to have been based on the recognition by the trappers that any one site could support only limited numbers in terms of food and fur resources.

The actual sites were chosen on the basis of providing a safe anchorage, and suitability for hauling up the boats. Of the total of 13 camps, 10 are associated with protective sandspits. This consideration took precedence over others such as the availability of water, general exposure to wind and weather, and suitability for digging ice pits. Over a period of years, other considerations based on experience were used to assess suitable campsites, such as prevailing ice conditions and the proximity of good hunting and trapping grounds, and this led to the dominance of certain sites. This pattern of site selection was not dissimilar to that on the mainland. Indeed most of the camps in the Baillie Island district had not been traditional ones, but were chosen undeı the exigencies of the fur trade and the schooner. Thus the settlement pattern of Banks Island, in terms of distribution, density and site choice, replicated that of the mainland, both in motivation and result.

Preparing the Camp

Upon arrival in early September, the schooners, containing the complete winter's outfits, were unloaded, and winched up on the beach. For their winter dwelling, each family erected a frame tent of lumber and canvas which they had brought with them. These were small, usually 10′ x 12′ or 12′ x 14′, and were insulated by a complete covering of moss, then surrounded by ice blocks. Small coal ranges served both heating and cooking requirements. Such a dwelling required about five tons of coal or, perhaps three if used in conjunction with seal blubber. As a ton of coal cost up to $200 at the time, families naturally tried to conserve their supply as much as possible.

Fall was a time of preparation for the trap line and winter life, as it still is. Freeze-up and snow soon followed the arrival at the camps. Small tents were used until the main dwellings were erected. Subsequently, several loads of moss had to be collected and hauled by dog-team. Sleds, toboggans and harnesses all had to be mended or made anew. Cutting and hauling fresh ice followed, both for water and as blocks to surround the tents. Such work was seldom completed until the end of October. All members of the family were engaged: the men went seal hunting and did heavy work, the women sewed and cooked and the youths were employed hunting ptarmigans and rabbits nearby.

Seal hunting began immediately upon arrival, close to shore and with the aid of a small dinghy carried on the schooner. Sealing continued during and after freeze-up at the floe edge, where a small, open, skin-covered boat in the shape of an umiak, large enough for one person, was used for retrieving. Each man attempted to get about 20 or 30 seals sufficient to last into February, before the trapping season opened, as seal hunting during dark days is difficult and brings small yields. With the coming of cold weather in October or November, the dogs were fed on cooked feed: a mixture of cornmeal or oatmeal and seal meat. This practice had been adopted by trappers on the mainland some time after the turn of the century, and greatly reduced both the amount of meat required for winter feed, and the total weight of feed for long sled trips inland.

One had also to obtain a good supply of caribou for human consumption. Accordingly, in late September or October when the snow lay sufficiently deep for overland travel, hunting forays were made by dog-team. Sometimes the hunters also fished through the ice on the lakes during these trips.

Trapping

Most trappers set out with six or seven dogs, a toboggan or basket sled and about 100 traps, although a few had 200 or 300. Many, coming to the island for the first time, brought only 50 or 75 traps. The trappers initially ran their lines along the coast, as it was the easiest route to follow. By 1936, the major river valleys had been discovered and utilized (particularly Masik, Kellett, Big and Storkerson), and a few trappers had experimented with overland routes and "portages" between the major valleys. Trap lines were seldom more than 50 or 60 miles long, and some trappers maintained two or even three lines at once. Trapping trips were about a week in length, although some men with longer lines went out for 10 or 12 days. Those who maintained short lines, especially in the first two or three winters, required only three or four nights to visit each line. Apparently the time spent in camp between

trips was roughly equivalent to the length of the trips themselves, so that the average trapper spent about half of the season actually on the trail. Thus in a 20-week season, most trappers made seven to 10 trips. Most of the line was set on the first trip, and extended on subsequent trips. On occasion it was shifted in mid-season to a new location. It was the practice to pull the line completely on the last trip and bring the traps back to be put on the boat, since the trappers frequently did not or could not return to the same camps each year.

The men normally trapped in pairs or threes, although some went alone. Right from the beginning of settlement (with one or two exceptions), only the men went on the trap line; the women and children stayed at home. This practice had already been in force on the mainland coast.

Snow-houses were invariably used on the trail, for overnight camping. The snow-house was, even in aboriginal times, rarely used by the Eskimos of the western Arctic, and the art of its construction and use was never as highly developed as it was in more easterly regions. On Banks Island they sufficed as overnight shelters for two men, who could erect one together in an hour or so. These snow-houses were frequently reused on subsequent trips throughout the winter.

The trapping season for white fox on the Arctic coast and islands extended from 16 November to 30 March throughout most of the first phase of settlement on Banks Island. There was little variation in the routine of life during these months, and trapping was by far the most important activity throughout. Before Christmas there was a secondary emphasis on caribou hunting. By the end of January the sun had returned, and as dog food would be running short, the trappers took the opportunity to hunt seals when ice conditions were suitable. Day or overnight trips were made to open water when home from the trap line, in hopes of obtaining two or three seals to tide them through the next trapping expedition. During March trapping was the sole preoccupation.

Spring Life

Trapping ended on 30 March by regulation, but at least four months remained until the boats could cross to the mainland. These were pleasant months; the hard work of trapping was over and the men could relax for a while at home, and with the milder weather and long days, the women and children could spend more time outdoors. Hunting could be indulged in for pleasure as much as necessity, and the mild weather and long days allowed the whole family to travel without discomfort.

Easter came soon after trapping, and the families from different camps congregated at Sachs Harbour or Sea Otter for a few days to celebrate this occasion, which for them was perhaps more social than religious. Upon returning to the separate camps, the men went seal and caribou hunting, while the women prepared the fox pelts for market. The chore of cooking dog food ceased in April, and the dogs reverted to a straight seal diet. After the geese arrived in the third or fourth week of May, many families went for a few days to the nesting grounds (discovered in 1932), to obtain both geese and eggs. Some families also went to various inland lakes in May to fish through the ice for char and trout. By the end of June inland travel becomes impossible, so sufficient stocks of caribou, goose and fish must have been put up to dry to see the people through until they could reach the mainland, usually in early August. On the departure of the snow, families moved out of their winter houses into lighter tents.

July was devoted chiefly to working on the schooners. They were caulked and perhaps painted, then winched off the beach into the shore lead. After the engines were put into working order, the boats were loaded. Everything was put on board: dogs, travelling and camping equipment, traps, meat, the winter's fox catch, even the canvas and lumber from the tents, because there was no guarantee that the party would return to the same spot the next year. Now they had only to wait for the ice to disperse and allow them unhindered passage to the mainland shore.

Summer on the Mainland

The brief visit to the mainland was hectic and exciting for summer was far more than a time for trade and resupply. It was also the occasion for reunion with families, relatives and friends; for the exchange of news, stories and experiences, and for enjoying the summer flowering of activity that characterized Herschel Island and Aklavik in those days. Little work was necessary, as the Bankslanders lived on their boats and the dogs were put ashore and fed on fish and scraps.

As September approached, the Bankslanders regrouped for the outward voyage. Some were absent, either because they did not wish to return or because they had done poorly and could not get outfitted. But there were usually some new faces; people who felt they could make a better living on the island, or who simply wished to join their relatives. And as always, there were the real Bankslanders, that core of perhaps a dozen families who returned year after year. Together they gathered behind the sandspit at Baillie Island, sometimes stopping at the post to pick up a last sack of flour or box of ammunition, or some other article remembered at the last, and waited for fair weather so they might set out for the great headland which beckoned them from across the gulf.

Such was the pattern and cycle of the Bankslander's life in the early days, with some variations from year to year and from place to place on the island. In the main, the island provided an abundance of fur and food to the settlers, although at times the people suffered from prolonged hunger and cold.

The Present Day

There are very few days in the year when the Bankslander is not doing something directly or indirectly related to trapping white foxes. There are many ancillary activities related to the trapper's livelihood, but in this section we shall concentrate on the trapping season itself and the immediate preseason preparation on the trap lines.

Preparation can begin several months before the season, for seldom will a light aircraft arrive at Sachs Harbour in the summer without someone chartering it to deposit cornmeal and coal oil at strategic points along his line. On such journeys the trapper uses the opportunity to study the terrain from the air, perhaps assessing a new route he has in mind for the coming winter. Those trappers whose lines do not pass any lakes large enough for an airplane may stock their lines in other ways. Some go north by canoe in the late summer to places where their lines reach the coast. Others may wait until October and go inland by dog-team, preparing caches while hunting caribou.

At the beginning of the season, one must haul traps, choose trap locations, build up mounds of earth and snow, toggle the trap chains to these mounds, then actually open and set the traps. This is time consuming; probably at least as much time must be spent at the trap site as in travelling between them, if not more. If one has already done everything but open and set the traps before season, clearly many more traps can actually be set on the first trip in November. As that day approaches, conversation in late October turns on little else; plans are made and everyone is in a rush to ensure that all equipment is ready. Competition is especially keen where several trappers follow the same general route, and each wants to be the first to open his traps. Some men are off with first light, others are inevitably delayed and do not get away until the following day.

Normally the trappers make five or six trips during the winter, each of a fortnight's duration. The first trip of the season is extremely important, not only because the return per track check is greater at this time of year (except in very poor years), but also because the amount of territory covered will tend to set the pattern for much of the rest of the winter. On the average, about 65–75 per cent of the traps are set on the first trip in November, covering perhaps 55–75 per cent of the final length of the trap line. Stopping and starting with a heavy load, a man can expect to average about four miles per hour travelling by dogs, while if he is making mounds, toggling and setting traps, five to seven minutes may be required for each set – although the fastest trappers can average two and a half or three minutes. In addition caches must be attended to: there are traps to be picked up along the way, and cornmeal and fuel to be deposited. Such caches may be spread along the line perhaps seven to 20 miles apart. With only about seven hours of effective daylight at this time of year, progress is necessarily slow.

In 1966 the mean length of the first trip was 20 days, 13 of which were spent travelling, setting an average of 31 traps per day. The return journey, checking traps, goes faster although in a big year when a fair proportion of the traps must be cleared and reset, the pace is still slow. The overall rate for the first trip is about 10 or 11 miles per day, with minor variation from year to year. On the second trip, although there is less effective daylight, most of it is spent travelling and checking traps, so that more territory is covered. From then on daylight increases, and daily mileage increases to over 20 by the end of the season.

On the second trip, only slight extensions of the lines are possible, as effective travelling time is so short. Major extensions are made in January or February – some men make only one trip during these two months – and by the end of this period at least 90 per cent of the line has been completed. Such extensions are made partly because the immediate hinterland begins to get trapped out, and also because later in the year the catch is thought to be made up mostly of travelling foxes, and the longer the line, the more likely it will cross the path of a migration. The trappers thus feel that if they had to choose between checking a short line often or setting a lot of traps but seeing them less frequently, the latter would be a superior strategy. On the March trip, one is usually inspecting the full line, which by this time averages about 130 miles in length with 470 traps.

The last trip takes place in early April, and the traps must be shut before returning. Some men pull their lines on the return trip, others on the outward leg so that they can take short cuts home. Most men take out their traps and cache them in piles of 50 or so along the way, although some traps are simply snapped and left toggled in the ground.

In a very big year it is not always possible to bring home the entire catch of a trip, and the frozen foxes must be cached on the trail. In such a case men may have to make journeys inland after the close of the season to pick up these foxes. Normally, however, all activity related to trapping, except for the preparation of pelts, comes to an abrupt halt on 15 April.

Trapping Skills and Route Selection

Trapping success is a function of both fox abundance and trapping effort. Three components of trapper effort may be identified. A man must first be skilful in the techniques of trapping and travelling. For example, he must master the manual skills of toggling, setting and baiting a trap, and he must know the qualities of different kinds of terrain, snow and ice, both for travelling and trapping. Second, he must know and understand the habits and behaviour of the animals he

is trapping. He must know how foxes approach the trap and thus how to arrange markers and baits, he must know when foxes are going for bait and what bait to use, and he must be able to judge where and when foxes are most likely to be plentiful. In the local parlance, he must "study foxes", and "know foxes". Finally he must work hard and maintain a good stock of capital equipment.

The first thing the trapper must do is select a route. Most of the older men have developed their routes out of long years of experimentation, sometimes in concert with partners who have long since emigrated. In some cases the sons have inherited these routes, and may have taken on new partners. Newcomers without immediate relatives, or whose relatives were already committed to other partners, have had to find their own routes. This they have done with the aid of maps and of bits of information picked up in conversation, although the established trappers are loath to share their personal knowledge.

Once established in a general area, the trappers seldom change their routes although they make minor variations in places, particularly at the ends. This is partly because they get to know their routes well and become wary of changing to another route of unproven worth, and partly due to the time and load-saving practice of caching traps along the route at the end of the season. One no longer has to start from home with a full load of traps, but neither can one be as flexible in routing. The trappers generally avoid encroaching on their colleague's routes, and this tends to work to the disadvantage of the new arrival, but there has been remarkably little friction over route selection in a situation where there is no institutionalized system of individual territorial or route line rights. The relatively fixed pattern of routes persisting over several years is a recent development however. In the schooner days it was customary to remove all traps due to the uncertainty of the next year's base camp. Since then the pattern has become much less flexible as individuals committed more and more equipment and knowledge to their routes. Formerly trappers were known to pull their entire lines and relocate them in mid-season to take advantage of localized fox abundance, but this has not occurred for several years.

Having selected a route, the Bankslanders travel in a fairly direct line along it, setting traps periodically along the way. Sometimes they are set as frequently as 10 or 15 to the mile, although the average is three or four. Some trappers set traps in pairs, most prefer to use a single trap at each site. Very occasionally, if a trapper happens upon an animal carcass or a fox den, or some other object likely to attract foxes, he will set out a number of traps around it. In the main traps are more or less evenly spaced, a quarter mile or so apart along the route.

The general preference for coast or valley routes is apparent, although some trappers have overland trails. More specifically, the trappers quite naturally prefer such easily followed terrain features as low coastal or river banks, valley terraces or small stream beds. Where a flat or gently undulating surface is to be traversed, large markers of snow may be erected, but frequently the trappers make their way without these. Small knolls, crests of river or coastal banks, or other small eminences in the terrain are sought for individual trap sites, again partly because of their visibility and partly because foxes tend to frequent such features.

To the uninitiated traveller, slowly sledging across this vast, almost featureless, snow-covered landscape in the dull blue half light of midwinter, it seems incredible that anyone could even approximately follow an unmarked route, let alone find every drifted-over trap along it. A multitude of tiny visual clues escape this traveller, but the experienced trapper knows those of his own route well, and he also knows the little tricks of navigation by which he can orient himself, such as drift direction, snow consistency, stars, etc. His well trained team of dogs will also assist him in finding the way. In fact, some trappers even if they have set out 700 or 800 traps over 200 miles, can probably visualize the location and set of every single one of their traps.

Steel leg traps are used exclusively. If no existing knoll is available, a mound is built up out of snow or earth. A small hole is made in the knoll, and the ring is toggled a few inches deep into it. Early in the season, when there is little snow, this usually requires an axe, later on the snow knife is the essential tool. Snow is pressed down tightly into the hole, sometimes with a small stone or clod of earth over the ring, and this soon sets and freezes hard. If done correctly it can only be removed with the aid of an axe at pulling time, otherwise a trapped fox can pull the trap out and drag it off.

A small depression is made in the surface of the mound, in the shape of an open trap, about an inch or so deep. The jaws of the trap are opened, it is set in this depression, and then papered over. The paper is stuck down at the edges with saliva, and serves the function of keeping an air space between the jaws and under the tongue, so that the functioning parts of the trap can remain operative and not be frozen in. Then a handful or so of fresh, loose snow is placed over the trap, and smoothed level with the surface of the mound with a snow knife. Care must also be taken that most but not all of the spring is covered with loose snow rather than being packed in, so that it can work easily but not be knocked out of place prematurely. Here a knowledge of the different types of snow and their properties when handled in particular ways is necessary. When snow is packed down and the air removed, it will set hard (this is also a basic principle of winter road construction), whereas the fresh, loose snow placed over the trap has no bearing strength and allows it to be triggered when stepped on by a fox.

The trap is then baited and marked. Bait can be placed in a variety of ways; either shaved or sprinkled around or over the trap, or placed in a lump near it, and it will only be used

under certain conditions. Seal meat or blubber is often used on the coast, while caribou entrails are favoured inland. Other types of meat are also used, and some men have experimented with commercially prepared scents, although apparently not with extraordinary success. When foxes are not going for bait, especially in late winter, a small "piss stump" is used. This may consist of a clod of earth, a piece of bone or antler, or small lumps of snow cut from where the dogs have urinated overnight; any of these will attract a fox to urinate on it, and when the fox approaches the stump he will be caught. Sometimes both bait and stump are used. Usually a larger clod of earth or a block of snow, set a foot or so away, marks the location of the trap. There are many ideas on the appropriate methods of placing bait and stump relative to the trap. These, along with the exact techniques of covering and baiting traps, are the jealously guarded trade secrets of each individual, but the basic method outlined here is common to all trappers.

Although the rudiments of trapping can be learned quickly, the refinement of its skills comes only through years of experience. Even the best trappers feel they are still learning, although some men in their late 20's and early 30's are already highly skilled. To gain an intimate knowledge of fox behaviour is considered to take even longer, however. The mastery of this aspect of trapping is generally agreed to lie with a very few older trappers. There is no substitute for 30 or 40 years experience.

Contemporary Resource Use and the Annual Economic Cycle

Changes in the community have been accompanied by modification in the technology and techniques of resource harvesting plus growing knowledge of the island and its resources.

The fall preparations changed very little until the 1960's. So long as the schooner and camp life persisted, the two months preceding trapping were practically all spent in setting up camp, and obtaining sufficient caribou and seal meat to last through the dark days. After 1960 when people began spending their summers on Banks Island, sealing for winter needs could be completed before freeze-up. Summer sealing, however, has required the purchase of canoes and outboards.

The middle two weeks of September, when sealing is over but the snow is not yet sufficient for inland travel, is now a much more relaxed time than in former days. Although many of the fall chores remain, such as hauling ice and mending travelling equipment, much of the five or six weeks preceding the trapping season can be devoted to visiting the mainland, hunting caribou, or preparing the trap line. This latter opportunity has raised the potential productivity of the season's trapping activity.

An additional consequence of having put up a good supply of seals in late summer is that little or no time is required during the trapping season to obtain dog food. The number of seals taken per trapper has probably not increased over the years (with the exception of 1963–1965 when seal skins became an important source of income), but the minimum requirement is now met at different times and with more concentrated effort. During the schooner days seal hunting occurred throughout the year, although the major effort came in fall and spring. The desirability of a surplus in fall was recognized, but this could be achieved only to a limited extent in the short time available. The construction of ice cellars at Sachs Harbour and Sea Otter eased the situation somewhat by allowing seals to be taken in spring before departure to be stored until the following winter. Now almost all seals are taken between May and October, with intensive hunting in July and August resulting in a large surplus before freeze-up. Rarely is it necessary to travel on new ice to the floe edge in October and November to augment the supply.

Finally, mention should be made of polar bears, which were hunted any time of the year, especially by trappers whose lines followed the coast. During the years 1928–1948, the take was less than today's because bears were used primarily for meat and clothing. Low pelt prices were the rule, and not until the 1950's, with the influx of transient whites with high wages and a desire for souvenirs, did there develop a good market for bear skins in the western Arctic.

Several modifications have occurred in travelling equipment and techniques. The number of dogs per team has gradually increased to about nine, and basket sleds have been replaced by toboggans. Mechanized transport was first introduced in 1961 but did not come into general use until 1967. Before 1948 snow-houses were always used for overnight shelter on the trail. Double walled canvas tents were introduced with the renewal of settlement in 1951, and within a few years they had completely replaced the snow-houses. Shortly after, caribou skins gave way to duffle and down in the manufacture of outer clothing.

The technology of trapping itself has not changed, although the pool of both equipment and experience has increased greatly over the years. The men run longer lines, make longer trips, and set more traps than formerly, and despite congregating at a single point, have maintained and even extended the total area exploited. Particularly important has been the development of inland trapping, which is far more extensive than ever it was on the mainland or Alaskan coasts, and has been a significant factor in the continued viability of trapping on Banks Island.

Some of the greatest changes in the early trapping pattern came in the 1940's. During the years 1945–1948, several trappers were running lines of 100 to 200 miles in length, with 600 or even 800 traps, and making trips of 10 to 14 days or more, much as is done today. A few of the best trappers were

spending up to 75 per cent of their time on the trail, making trips of 17 or 18 days.

This fairly rapid growth in the number of traps and the length of lines was probably a response to the declining economic conditions: a recognition that in order to make a given amount of money one had to get more foxes than before, and that this could only be done by setting more traps over a greater distance. This had not happened at the end of the 1930's, when prices were low, because there had been both a greater abundance of foxes and less surplus capital to reinvest in traps.

The total area utilized for trapping on Banks Island has continued to increase despite the abandonment of the camps. This is in sharp contrast to the experience of the older and larger fur trade centres, both in the northern forests and on the tundra. There centralization has been accompanied by the abandonment of the outlying resource harvesting areas, in favour of the immediate hinterlands, which then become over-exploited. Although the number of points of origin for trap lines has steadily declined since the 1930's, adjustments in the length and arrangement of trap lines have more than compensated for this, even since the final abandonment of the camps. During the most recent period, the consequence of the increased trapper population has been a spectacular expansion of the area of intensive use, rather than of the maximal extent.

The white fox resource system was born on the mainland and successfully transplanted to Banks Island. There it found an environment which sustained and developed it well enough to withstand the periodic adversity the years visited upon it. Once it withered badly, and on other occasions wilted, but it clung to life. Today trapping on Banks Island is in good health.

Postscript

(Some current observations on the Banksland trapper; added March 1975)

In the decade that has passed since the above remarks were written a number of changes affecting the trapping adaptation have occurred, some of which are outlined below.

The trapping system on Banks Island has, despite several altered circumstances, remained largely stable. The intervening years have seen the replacement of dogs by snowmobiles as the exclusive means of overland transport. This innovation has modified the annual cycle, and allowed trappers to reduce the amount of time they must spend on the trap line. Trapping excellence and productivity remain high, with 1973–1974, for example, producing a crop of nearly 10,000 foxes. In that year, one trapper alone took over 1,500 foxes, another over 1,100. Interest in trapping remains high, with some young people trapping with their fathers or relatives, and a few applications received each year from mainland trappers wishing to join the local trappers association.

More generally, in the western Arctic and perhaps elsewhere, the decline in trapping which seemed so evident in the mid-1960's now appears to have stopped. For some areas, there is evidence of larger numbers of fur-bearers being taken in recent years, and this appears to be a general trend, not merely a reflection of higher population levels among fur-bearers. It is also the case that the fur market has improved significantly in recent years. However, whereas previously people trapped through tradition, and did so every year regardless of price, increasing numbers are now comparing the economic returns from trapping and from alternative economic pursuits. The snowmobile has also been a factor in ecouraging participation in trapping in that it provides the individual with greater flexibility in making such a choice: keeping a dog-team is a constant preoccupation whereas maintaining a snowmobile is not (see Usher 1972 for a full discussion of snowmobile use in trapping).

The snowmobile allows people to cover much more territory in a relatively shorter time than before, and in particular, wage-employed persons can travel considerable distances on weekends and holidays. As a consequence, the phenomenon of over-hunting close to the settlements and under-utilization of hinterland areas (which was characteristic a decade or so ago) is now less evident.

The total number of full-time trappers may still be declining, but apparently not the overall importance of trapping for with snowmobiles more people can participate as part-time trappers. It is also evident that as alternative economic opportunities have increased in the western Arctic, trapping and hunting have become increasingly discrete endeavours; hunting remains a vitally important part of the culture and economy of the region, even when people stop trapping.

The vastly increased flow of cash into the region in the last few years may also have solved some of the problems of chronic under-capitalization in the trapping industry, at least for those with the most ready access to this cash. Nonetheless, it is still true that some of the older, more traditional trappers, and perhaps also some young people trying to get a start, have their difficulties. The credit system formerly offered by the trading companies has been virtually terminated, and government assistance programs for the industry are still very limited.

In recent years there has been some move among a few older people on the mainland not only to go back to trapping, but to go back to the land itself and move out of the settlements altogether. In particular one can cite the resettlement of Cape Bathurst by several families, and their attempts to re-establish a trading post there.

Trapping, and the way of life it sustains, is still the heritage of the western Arctic, and today's adults remain acutely conscious of that fact. There is still some recruitment of young

people into trapping, certainly more than most observers (such as social scientists and administrators) would have predicted a decade ago. While many of these young people do not necessarily foresee a lifetime career in trapping, they are anxious to gain the skills, and consciously prefer the trapping life to existing alternatives.

In conclusion, trapping appears so deeply rooted in Eskimo life in the western Arctic that it will likely remain a significant feature of that life for the foreseeable future, despite the presence of alternative occupational opportunities.

Reference

Usher, Peter J.
1972 The use of snowmobiles for trapping on Banks Island, N.W.T. *Arctic,* 25 (3): 171–181.

Views on Land Expressed in Inuit Oral Traditions

by Eugene Y. Arima*

Introduction

This essay seeks to outline the contribution which Inuit oral traditions, namely, myths, legends, tales, beliefs and songs, can make to an understanding of man/land relationship values, attitudes and behaviour in Inuit culture.

To this end I have examined the classical scholarly literature from the whole Inuit area but have ignored those contemporary writings by Inuit authors, and material collected in the more recent, acculturated, past.

With the foregoing restriction established, the study at once experienced the problem that in the classical literature on traditions, there was no abundance of expression of man/land relationships. This scarcity of reference to land was not likely due to incomplete coverage by the sources, for many were quite comprehensive and, moreover, considerable overlap occurred both within and between the published texts of traditions originating from the various Inuit "tribes", for example, the Mackenzie, Copper, Netsilik, Caribou, Igloolik, South Baffin and Labrador Inuit. Rather it would seem that the relatively low prominence of the land in Inuit traditions stems from its essentially all-pervasive environmental nature, providing as it does a vast background or universe which encompasses Inuit reality.

The procedure adopted was to examine the classical sources on traditions, evaluating the significance of each text in terms of what is generally known in an ethnological sense about Inuit culture. While not every possible source was studied, the coverage obtained (see References, p. 221) was judged both representative and adequate. Certain reported statements about the land, outside of the strictly mythic or poetic, were included if they appeared to express standardized traditional thought, rather than individual opinion bound to some particular occasion. Such expression is presented particularly by Knud Rasmussen, whose works inevitably become primary in a study of Inuit traditions, more especially for the central regions in Canada.

Traditional Narratives as True Accounts

The Inuit did not distinguish between myth, legend, simple tale, fable, etc., as scholars are wont to do, but regarded all traditional narratives as true accounts of real events.

Although the early investigator Rink noted (1885: 83) that the Greenlanders distinguished the ancient (*uqalugtuat*) from the more recent narrative (*uqalualaarutit*), such differentiation does not seem to exist elsewhere. In Canada all traditional narratives are commonly termed *unipkaatuat*.

As with preliterate peoples generally, Inuit could take the seemingly imaginary and fantastic content of myth to be real because conditions were held to differ in earlier times, and what would not happen now did happen before. Also, even in the present much was possible which was supernatural. Thus matters inexplicable in natural terms were explained by reference to pertinent myths (Rasmussen 1931a: 363). As myths were the basis of Inuit belief, what they expressed regarding the land was revealing of Inuit outlook.

The Land as Primary in Inuit Cosmology

Summarizing the cosmological beliefs of the Copper Inuit of Coronation Gulf, Rasmussen wrote that for them the world consisted of *nuna,* the land, *tarajuq,* the sea, and *hila,* all the space above (1932: 22). Moreover, *nuna* was the world itself, stretching endlessly in all directions. Among the Netsilik to their east, he recorded from an old woman that: "The world is not only that we can see. It is enormous, and also has room for people when they die . . ." (1931a: 315). After death the widespread belief was that souls could go to a land of perpetual pleasure in the sky or one or more lands under the earth's surface at different depths (Boas 1907: 130–131; 1964: 180–183; Hawkes 1916: 153; Lyon 1824: 372–374; Rasmussen 1929: 94–95; 1930a: 79; 1931a: 315–319; Rink 1885: 37). The sky land is interesting for expressing the ideal land for the Inuit: it is a great plain with plentiful game, with great herds of easily hunted caribou. Further, sea beasts can be hunted with the help of the Moon, the patron spirit of hunters, who lives in the sky land. There are great villages with houses standing in long rows, where all kinds of games are played, with football the favourite, and people are laughing and singing. The sky land is supported by pillars from the surface of the earth of living experience (Rasmussen 1931a: 209).

The best information on Inuit cosmology has been recorded from the Netsilik of the central Canadian Arctic. Whether cosmological beliefs were as developed elsewhere is not certain, but since central groups show close relationship in general culture and language, it may be that the Netsilik in their more isolated position best preserved Inuit tradition into this century. One of their myths on the first times related that, ". . . the earth was here before the people, and the very first people came out of the ground from tussocks" (Rasmussen 1929: 252; 1931a: 209). In the beginning men were poor at hunting so that the principal food was earth, while women were often barren and searched the ground for children of the earth which it gave to them (Rasmussen 1929: 253–254; 1931a: 212).

Nuna, the land, the earth, the world, was thus primordial, existing from the beginning and providing people, apparently having volition like a live being. Also, the caribou, so highly

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valued for its fine meat, delicious fat and marrow, and extremely warm but light fur for clothing, first came from within the earth (Rasmussen 1930a: 83; 1931a: 319).

The Land as Vast and Populated with Strange Beings

The land as the surface of the earth was regarded as practically limitless in expanse, and, like other peoples, the Inuit populated its unknown reaches with fantastic beings. Myth characters who wandered far would meet these strange creatures who thus became known to the Inuit. When Aningaat and Siqiniq, the brother and sister who became the moon and the sun, go off into the world in shame for killing their mother, they meet the Kukiligatsiait with long claws and the bottomless Itqingat in the Igloolik and Netsilik versions of this major myth (Rasmussen 1929: 77–81; 1931a: 232–236; 1931b: 524–526). The "epic hero" Kiviuq of the central regions and Greenland has his series of adventures with assorted creatures while travelling through distant lands after being blown out to sea in his kayak (Boas 1964: 213–216; Holtved 1951: 41–45; Rasmussen 1929: 287–290; 1930a: 18–20; 1930b: 46–51; 1931a: 365–377; 1931b: 523–524). An Alaskan variant has the kayaker Misangna blown out from King Island and circumnavigate the Arctic Ocean (Ostermann 1952: 216–222). Sometimes it is specified that these travels take long, virtually a lifetime, or the hero is virtually immortal, attesting to the vastness of the world.

One well known myth, about Atungaq or Atungait, has him travelling far with the express intention of going around the world; inevitably he becomes terribly old by the time he gets back home, so huge is the land (Holtved 1951: 35; Rasmussen 1929: 285; 1931a: 300–301, 391–394). If a more recently recorded (in 1964) variant may be cited, a Labrador story-teller commented at the end that Atungaq and his wife, ". . . had tried to go around the world, but because the world is large, they did not go around it although they returned to the same place, to their home, thinking that they had gone around" (Nungak and Arima 1969: 61).

The Land in Song

In myths the land is vast in theory as it were. Its magnitude was also appreciated in actual experience as the Inuit moved through their spacious country, and this empirical appreciation was perhaps best expressed in their poetic songs which were more individualized than the narratives, being, for the most part, personal compositions. It is in the songs about hunting and travelling especially that occasional reference to the land occurs. The land could be sung about as being great and beautiful as in the Baffinland song beginning: "Ayaya. The great world is beautiful when summer is coming at last" (Boas 1897: 114). Or there might be repeated reference to being "on the land" (*nunamili*), or "away up inland" (*qamungaa* or *pamungaa*), as among the Caribou Inuit for whom Rasmussen gives a sample of seven lyrical songs, five of which contain such repeated allusions to the land (1930a: 67–73).

The words of such songs celebrate a much loved existence, ranging far over the open tundra in pursuit of caribou and other game. A song of the Copper Inuit, who were fine singers, went, "I began to walk; to a beloved land I began to walk" (Roberts and Jenness 1925: 459).

Songs also named specific places at times, mainly hunting and fishing locations or landscape features along travel routes. In the extensive sample of 84 Copper song texts given by Roberts and Jenness, seven include place names, three of them listing several (1925: 408, 409, 422, 440, 458, 464, 476). Place names were vital to the Inuit for, as a Caribou hunter explained to the writer, they had no maps and could know the land only through its names. In addition, the place names tended to be charged with associations (see chapter by Correll, p. 173), as is to be expected when life was so closely and intensely bound to the physical landscape.

Thus place names were most often featured in songs about travelling, with necessarily capable men undertaking long, arduous journeys and later singing about them. A good example is a composition by a great Netsilik traveller, Nakasuk, which begins as follows:

> Through the Quungursuaq ravine
> Over the Kingaarqut mountains
> Alinaitsulik lake
> Laying my path round about
> And the Qamanigluk broads;
> Kalivtarsiurvik river
> I set my course along, alas!
> And when the sledge cross-slats dragged in deep snow
> It was very hard work. (Rasmussen 1931a: 330)

The words may seem simple when written out, especially in awkward translation, but it might be remembered that folk song expresses the basic concerns and values of the core of a culture, strongly reinforcing the expression through simultaneous redundancy in lyrics, melody and rhythm.

Inuit songs naturally show a foremost concern with game animals and hunting, and since these existed in the natural setting of the land, it might be said that much of their song was ultimately related to the land. And their overall quality might be said to be one of controlled intensity, indicating great feeling for their environment.

Place Names in Narratives

Traditional narratives generally did not mention places in profusion but might specify one or more locations where the account begins or ends, or where a major event occurs.

In the Igloolik version of the myth of the origin of the major kinds of mankind, as known to the Inuit, for example, the principal character when pregnant by her dog-husband is confined on Qiqirtaajuk (Rasmussen 1929: 63), now identified as a point joined to Igloolik Island where other incidents of the myth were localized as well. In the Caribou Inuit version of this same myth, the girl is taken to Anarnituq Island in Lake Haningajuq (Rasmussen 1930a: 101).

Fog originated when a bear tried to drink up a magically created river and burst. Among the Netsilik that river was the Kuugtaaq near Utkuhikjalik on the Back River (Rasmussen 1931a: 376), but among Labrador Inuit the same river is on the east side of Hudson Bay.

The tendency is to localize mythical events in one's own territory; thus myths, unlike songs, are unreliable in their specification of place, as is to be expected, of course. But the important aspect is that the Inuit further stamped the land as theirs and identified with it by imbuing it with specific myth associations.

Home

When myth specifies place, it is often the home of the protagonist. Even when his or her home location is not named, it is often established in general terms as being on the coast, by a lake, beside a river, and so forth, so that there is a home. Even animals, fantastic creatures, spirits, or the other races of mankind, are all assigned to characteristic locations. Thus, for example, wolves and grizzly bears customarily dwell inland in myth as in reality. Also dwelling inland are the hostile Indians, the dwarf Inurarutligaarjuit and the fleet Ijirqat spirits. Eagles live on mountain tops and whales on islands in the sea. That a great variety of powerful and potentially dangerous beings live inland and that adventures with them occur when man ventures there is appropriate given the primarily maritime orientation of the Inuit, who, for the most part are less familiar with the interior.

Inuit culture has a land-based component as well, of course, and the resultant duality of the contrastive but interdependent sea and land aspects is reflected in myth when characters move, seasonally or more permanently as, for example, through marriage, between the coast and the interior. When conflict develops, as it almost must in myth, the characters usually return to their original location.

Wherever home might be, the striking point is that practically everyone in myth has one, usually that character's place of birth or childhood at least. Should a character leave his original place, home is usually re-established sooner or later. In view of the comparatively high degree of movement between residence locations among the Inuit in most areas, one might wonder whether there was not some anxiety about having a place to call home.

In a north Alaskan myth, a man says, "an orphan will always return to his home" (Spencer 1959: 388); an orphan epitomizes homelessness, of course. Incidentally, in one passage in this particular myth the ground, on request, protects him from pursuing wolves, foxes and grizzlies by making him undetectable (*op. cit.*: 389), again showing that the land is viewed as supportive of mankind and benevolent.

Inuit myths are in large part about perilous adventures which virtually always occur away from home and very often the adventures and the narrative end when the main character or characters get back to home and safety. Such a scheme is common in folklore the world over. Here it is mentioned to confirm that the Inuit, in their traditions, do express a strong valuation of home.

Perhaps the keenest expression of attachment to home is the story of a seal hunter, of Aluk in east Greenland, who so loved his place where he would watch the sun rise over the sea and ice that he never left it until persuaded to move by his son in his old age. Badly homesick, he returned to Aluk and when he again saw the sun rise in the old place, his heart burst for joy (Schultz-Lorentzen 1928: 258–259; see appendix for the full account).

An essay on man/land relationships in Inuit traditions cannot overlook their account of the origin of the Indians and the whites, uncomplimentary as it may seem to derive those peoples from the union of a girl – who wouldn't marry – with a dog (e.g. Boas 1964: 229; Holtved 1951: 23–26; Rasmussen 1929: 63–64; 1930a: 101; 1931a: 380–381; Schultz-Lorentzen 1928: 256–257; Turner 1894: 261). After running out of food, the girl sends off her dog-children from the island where they are marooned on her boot soles: some drift to the mainland to become Indians and the others drift out to sea to become the whites.

Thus the three main kinds of people known to the Inuit are associated with distinct parts of the world in mythology: the Inuit belong to the Arctic, the Indians to the interior of the mainland, and the whites are across the sea. In short, the races have their places in the Inuit view.

The Land as Sacred and not to be Disturbed

Nuna as a kind of protean being supporting all existence was to be respected and left undisturbed. In the central Arctic this attitude was codified in the tabu rules surrounding the caribou which, it may be recalled, originally came from within

the earth. For the Netsilik, Rasmussen recorded under the heading, *Views of life,* the following:

> The earth, and everything belonging to it – stones, grass, turf, etc. – are sacred throughout the whole of the summer, both at the salmon places and at *nablut*; for this reason alone stone huts must never be built, nor must one break stones, pluck grass, or wipe hands on grass. (1931a: 265)

The *nablut* were the water crossings where the caribou were lanced from kayaks. At these sacred places bones were not to be cracked with stones for the marrow. An Igloolik narrative recounts that the earth suddenly closed over a woman who broke this tabu, as the powerful souls of the caribou killed her (Rasmussen 1929: 57–58). *Nuna* was certainly involved, as Rasmussen wrote of Caribou Inuit belief about the caribou, "they are on the earth and belong to the earth" (1930a: 49).

There are old stone houses and graves to be seen in the central regions which necessarily entailed working in the earth, but they were ascribed to the preceding Tunnit people (Rasmussen 1931a: 113–114).

An Alaskan creation myth from the Noatak river region also expresses aversion to disturbing the land. The Creator Raven in his original human form fashioned a being out of clay like himself, then waited for what might happen:

> Scarcely had the new man become alive when it began to push the earth up with its arms. It was restless; untiringly and continuously it pushed earth up around it – and he found that this being was of a mentality different from his – an excitable violent temper. This did not suit him, so he seized the thing, dragged it to the abyss and flung it down. (Ostermann 1942: 62)

There may be acculturative influence in the myth, but the featuring of the aggressive disturbance of the earth and the negative judgement of it seems very Inuit.

In conclusion it may be reiterated that the land in Inuit mythology was a primary entity as the all encompassing world. Being conceptually environmental, it was not prominent traditionally, in direct expression, but sufficient allusions exist to intimate its fundamental importance. *Nuna* was regarded by the Inuit with admiration and joy for its vastness, beauty and bountifulness, with affection as being their home whether comprising a specific dwelling place or as a group territory, and with humble respect to the extent of being against disturbing it, insofar as disturbances to the land are uncompromisingly viewed as negative behaviour.

Appendix

The Sealer from Aluk Whose Heart Burst, When He Saw the Sun Rising above His Dwelling-Place

There is a legend of a sealer from Aluk who never left the place where he was born. He loved his dwelling place so dearly that he was reluctant to go elsewhere to catch seal; but then he never suffered want where he was.

But this man had a son, and when his understanding awoke, he realized that he had never been outside Aluk. When the other men of the dwelling place went out on hunting expeditions, he often wished to go with them, but as he was very fond of his father, he never showed it. At times he made attempts to rouse his father's inclination to travel, but the latter only answered: "From the moment that I took land at Aluk, I do not remember ever having left it."

But whenever they were left behind alone, and all the young men had departed for strange coasts, the son became silent.

When midsummer came, the father could not sleep in the morning at the hour when the sun rose above the country. It was said that it was because he must see it rise above the sea, while the rays, as it were, splintered against icebergs. This sight moved him so deeply that it was impossible for him to leave his dwelling place.

Thus the years passed. But when because of old age the father was unable to go out sealing, and the son had to do it alone, he could no longer resist the temptation to see the world, and so on one fine spring day he said to his father: "This time I intend to leave my dwelling place and to go and look for new things in strange parts."

For a long time he waited for his father to reply, but the latter remained silent, and as he did not answer the son once more tried to conquer his desire to travel. Only later on, when he could no longer hold his thoughts in check, he determined not to let himself be silenced, until his father had acceded to his request.

Once when he returned from a sealing trip, and they sat waiting for the evening to fall upon them, he therefore again began to speak to his father:

"This time it must be; now I want to leave my country and to go north and look for new things in strange parts."

But his father did not answer. Not until the son once more addressed him did he say that now there was no way out.

"But then we will not go too far north, and you must promise me that we shall return to our dwelling place."

The son was very happy, and he eagerly set about making his umiak ready for the journey.

And one morning when the weather was fine, they at last started north. And they travelled far, far, and the farther north, the better the son liked the country.

And they travelled and travelled, and it was the first time that the father had been away from his native place for so

long. And the more the summer advanced, the more he saw his country in memory before him. And he was longing for it, and after a while sleep left him, and in the morning, at the time when the sun rose, he could not sleep; for he ever felt impelled to go out in order to see whether the sunrise would be as it was at his native place. But always the mountains blocked the horizon so that it was impossible to see the first peep of the sun.

At first the old man would not speak about it to his son, but when he could no longer bear his yearning he spoke up, saying:

"Let us now return; otherwise I shall die with longing!"

It was hard for the son to return now that the country became more and more beautiful in his sight. And yet he once more shaped his course towards the south, as the words of his father kept on sounding in his ears.

But although they were now on their way home, it was as if the father was only getting worse and worse; for he hardly ever slept, and when they awoke in the morning, he was walking about outside the tent. They travelled and travelled, and at last they came back to their dwelling place.

Quite early, on the following morning, the son awoke at the sound of his father's voice, and the words he spoke were:

"No wonder that it is hard to leave Aluk! Behold, the great sun when it rises above the sea, and its rays break against the icebergs of the horizon."

And he heard the old man repeatedly utter exclamations of joy, and then everything was quiet. He listened for a long while, but as he heard no sound from his father, who was just outside the tent opening, he got up and pulled aside the tent covering. And lo – there the old man lay on the ground with his face turned towards the sun. And when the son lifted him up, he did not breathe.

Thus the old sealer once more saw the sun in his native place. His joy was so overwhelming that his heart burst. And the son who felt guilty of the death of his father, built a grave for him on the top of the mountain, overlooking the view which he had loved while alive.

And later on it was told that he came to be like his father, nor did he ever leave his dwelling place, but remained at Aluk until the end of his days.

(Schultz-Lorentzen 1928: 257–259, translated from Knud Rasmussen, Myter og Sagn, II)

References

Birket-Smith, Kaj
1953 *The Chugach Eskimo*. Nationalmuseets Skrifter Etnografisk Raekke, VI. Copenhagen.

Boas, Franz
1897 Eskimo tales and songs. *Journal of American Folk-Lore*, X: 109–115. Boston and New York.
1907 The Eskimos of Baffin Land and Hudson Bay. *American Museum of Natural History, Bulletin* XV, 1901. New York.
1964 *The Central Eskimo*. Bison Books paperback reprint. University of Nebraska, Lincoln. (Original published 1888. *Bureau of American Ethnology, 6th Annual Report, 1884–85:* 399–699. Washington.)

Hawkes, E. W.
1916 *The Labrador Eskimo*. Geological Survey of Canada, memoir 91, Anthropological Series no. 14. Ottawa.

Holtved, Erik
1951 The Polar Eskimos, language and folklore. *Meddelelser om Gronland,* 152 (1 & 2). Copenhagen.

Jenness, Diamond
1924 Eskimo folk-lore. Part A: Myths and traditions from Northern Alaska, the Mackenzie Delta and Coronation Gulf. *Report of the Canadian Arctic Expedition 1913–18*, XIII. Ottawa.

Kroeber, A. L.
1899b Tales of the Smith Sound Eskimos. *Journal of American Folk-Lore,* XII: 166–182. Boston and New York.

Lantis, Margaret
1946 The social culture of the Nunivak Eskimo. *Transactions American Philosophical Society,* 35 (3): 152–323. Philadelphia.

Lyon, George Francis
1824 *The private journal of Captain G. F. Lyon*. John Murray, London.

Nelson, E. W.
1899 The Eskimo about Bering Strait. *Bureau of American Ethnology,* 18th annual report, part 1. Washington.

Nungak, Z., and E. Arima
1969 Eskimo stories from Povungnituk, Quebec, illustrated in soapstone carvings. *National Museums of Canada, Bulletin* 235, Anthropological Series no. 90. Ottawa.

Ostermann, H. (editor)
1942 The Mackenzie Eskimo, after Knud Rasmussen's posthumous notes. *Report of the Fifth Thule Expedition 1921–24*, x (2). Copenhagen.
1952 The Alaskan Eskimos, as described in the posthumous notes of Dr. Knud Rasmussen. *Report of the Fifth Thule Expedition 1921–24*, x (3). Copenhagen.

Rasmussen, Knud
1929 Intellectual culture of the Iglulik Eskimos. *Report of the Fifth Thule Expedition 1921–24*, VII (1). Copenhagen.
1930a Observations on the intellectual culture of the Caribou Eskimos. *Report of the Fifth Thule Expedition 1921–24*, VII (2). Copenhagen.
1930b Iglulik and Caribou Eskimo texts. *Report of the Fifth Thule Expedition 1921–24*, VII (3). Copenhagen.
1931a The Netsilik Eskimos, social life and spiritual culture. *Report of the Fifth Thule Expedition 1921–24*, VIII (1). Copenhagen.
1931b The Utkuhukjalingmiut. *Report of the Fifth Thule Expedition 1921–24*, VIII (2). Copenhagen.
1932 Intellectual culture of the Copper Eskimos. *Report of the Fifth Thule Expedition 1921–24*, IX. Copenhagen.

Rink, H. J.
1885 *Tales and traditions of the Eskimo*. Wm. Blackwood and Sons, Edinburgh and London.

Roberts, Helen, and Diamond Jenness
1925 Songs of the Copper Eskimos. *Report of the Canadian Arctic Expedition 1913–18*, XIV. Ottawa.

Schultz-Lorentzen, C. W.
1928 Intellectual culture of the Greenlanders. *In Greenland*, M. Vahl, *et al.* (editors), vol. II, pp. 209–270. C. A. Reitzel, Copenhagen and Oxford University Press, London.

Spencer, Robert F.
1959 The north Alaskan Eskimo; a study in ecology and society. *Bureau of American Ethnology, Bulletin* 171. Washington.

Thalbitzer, Wm.
1923 The Ammassalik Eskimo, part II, Nr. 3, Language and folklore. *Meddelelser om Gronland*, 40. Copenhagen.

Turner, Lucien M.
1894 Ethnology of the Ungava district, Hudson Bay territory. *Bureau of American Ethnology, 11th annual report, 1889–90*. Washington.

Inummariit: The Real Eskimos*

by Hugh Brody**

Inuk is Eskimo for an Eskimo. The plural, *Inuit,* means "people", and is the Eskimo word for Eskimos as a whole. By a process of adding middles and endings to a root, the Eskimo language uses single words that, when translated into English, can form long and grammatically complex sentences. A simple example is the Eskimo word for the Eskimo language, *Inuttitut*: *Inuk* (a person, an Eskimo) + *titut* (in the manner of). The same word is used to mean both "Eskimo language" and "like a person" or "the way a person does". Another simple example is *Inummarik,* "a genuine Eskimo" or "a real person": *Inuk* (an Eskimo) + *marik* (genuine). The plural is *Inummariit,* "the real Eskimos". The combination of these two examples shows the structure of a third term, *inummarittitut: Inuk* (an Eskimo) + *marik* (real) + *titut* (in the manner of), hence "in the manner of a real Eskimo". Some people are said to eat, work, talk or even walk *inummarittitut.*

Not very long ago, the *Inummariit* lived in camps, close to the land. They were people of distinctive skills and personality. Many of their ways – economic, familial and individual – are remembered and respected by the Eskimos of today, and even by the young men and women who live under the hegemony of whites in the new northern settlements. The attributes of *Inummariit* can be readily discovered in Eskimos' accounts of life as it used to be and of certain famous individuals. And there are epithets, phrases and remarks to follow these stories, brief comments on traditional ways, such as *Inummariugamik,* "because he is a real Eskimo". Or, less happily, something of the customs of the *Inummariit* can be gathered from complaints now made against opposite qualities, especially against modernity that is plainly antagonistic to the "real" things – for those real things are, in the conscience of most Eskimos, representations of human goodness, honesty and strength.

Inuit conceptions of tradition lie, therefore, within the compass of the meaning of *Inummariit* or *Inummarititut.* The common use of these terms displays a strong consciousness of tradition. And tradition is the right word: the Eskimos of the Canadian eastern Arctic are acutely aware of the passing of a way of life, and they tend to see in its passing the disappearance of what was best in their past. Nostalgia for these older ways is characterized in the same words, attitudes and moods that are used in other societies to express regret for the loss of traditional elements: there is sadness, a feeling of inevitability, and wavering between nostalgia for the past and acceptance of the new. Regret is deeply ambivalent.

Many Eskimos are very aware of their ambivalence about old and new. If their traditional life was hard and occasionally brought hunger and distress, many of its qualities and some of its dignity depended on a patient resistance to hardship. For this same reason, many of the older, most traditional-minded men and women warmly accepted the new ways. Now that they find these new ways are not what they had hoped, they wish to recover their own tradition. There is no naïvety in this desire. Those Eskimos who had lived on the land are not eager to return to total dependence on the land alone, for they have not forgotten the dangers of such dependence. Their ambivalence will be evident enough in the next pages, where I shall try to describe the traditional life of the Eskimos as they themselves recall it. Many of my discussions of the old days – which were often only about 10 years ago – arose in the context of: "Was it better then?" The quotations and anecdotes given below move back and forth between the past and the present.

In the old days, permanent Eskimo camps were small, usually with no more than two or three families, rarely as many as 10. They were scattered along the northern coast of North America and some of the Arctic islands, but, with the exception of the Caribou Eskimos, they were rarely sited inland. They were essentially base camps from which the hunters made long journeys inland or along the coast that lasted days or even weeks. When the federal government introduced its low-rental housing program in the 1950's, some families chose to have their prefabricated timber-frame house built at their base camp, rather than in one of the administrative centres. These houses were sometimes as far as 100 miles from the nearest settlement. Settlement Eskimos still identify themselves as the people of some place or other and, in answer to the conventional question, *Nani nunaqarpit?,* "where do you have land?", a man will give a résumé of all the places he has "had land". Some hunters were evidently more mobile than others and they might be vague about their base camp, but most of the people would answer that question with "in such a place I had land", and that place was a permanent camp. Even today, the people in settlements know very well who comes from where, an awareness that is often a sign of social divisiveness. Many groups of families, having been camped at or near the same place over a long period, have become interrelated by marriage.

In many communities of the Canadian eastern Arctic, the move from camp to settlement has only just finished. In a very few places, there are still some families who continue camp life during part of the year, and who definitely feel that they do not belong to the settlement. However much they may depend on settlements, or have near-relatives who finally moved into low-rental housing in a government village, whatever their problems of isolation as the last to stay on the land, such men as the *Inummariit* still keep many or most of their possessions in the camp and try to spend as much time there as possible. Some families who have been forced to move into a settlement will still insist that the move is temporary, the consequence of some passing adversity such as sickness

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or poverty, and that they will soon be back in camp again. Such individuals are widely respected.

One elderly man moved from his camp to the settlement during the spring of 1971. His camp was close to the village, and he could walk to it in a day. He had, over the preceding four years, divided his time between his camp and the houses of his relatives in the settlement, so this final move into the settlement might have been thought to represent only a slight readjustment. For the man himself, however, it was a difficult and important decision: he felt that he had given up his real life for a foreign world. During the next two years, that man travelled with his dog-team to exactly the same places as before, he hunted for the same animals, employed the same techniques and technologies as he had always used. What, then, was the crucial difference for him between living in camp, where he was a "real" hunter and trapper, and living in the settlement, from which he also hunted and trapped? Here is a part of his answer.

> In camp each year, every year, sea animals were there. They were there all the time. Now there seems to be fewer of them – especially harp seals. The harp seals can no longer be readily found. I am sure that there used to be more animals along the shore, farther along the shore. When I used to travel a lot I would notice that the caribou were few: now I think that the caribou are more abundant. Recently, inland between Pond Inlet and Clyde River, there seem to be many caribou. In that land there is a place called Anaulirialik, a narrow spot by a river. We travelled there from camp, and could find caribou. Today there are caribou all over the land; the hunters do not need to go to special places.
>
> In the past we used to hunt, particularly for seals. Once we left the camps that became harder. There is as much game as there was, but it is much harder to hunt than it used to be. Yes, it is harder; there is a long journey to the seals. In the camps we could simply stay and wait for the animals. Even narwhals would just come to us. During the summer it was not necessary to go out of the camps at all. In the settlement the journeys are long, long at all times of the year.
>
> In the old days we Eskimos used to live only on wild animals. The old people were brought up on wild country foods. Their stomachs are used to that, and even today there are many who can buy good things at the store but still prefer to eat the wild animals with the blood and everything, so that they are really satisfied. It is only with the wild country food that they are satisfied. They get weak on store food, and these men as old as I, we have to try and hunt for other people. But there are today men who do not really bother hunting: they have to stay in the settlements. In the old days we all had to be anxious about hunting, we could hardly wait. Today the men do not seem to be the same way. They have got better equipment, but I wonder how come they do not seem to be able to get the same amounts of good wild country food.

Camp life, then, ensured that most hunters were as close to the animals, especially to the sea mammals, as they needed to be. The Eskimos distinguish very clearly between sea and land mammals, using distinctive terms for the "skin" and "fat" of these two categories, and a set of taboos once militated against any blurring of the distinction. In aboriginal days, the camps for hunting sea mammals and those for land mammals were kept firmly apart. Preparation of caribou meat or skins on the sea ice was taboo. But the permanent camps of the *Inummariit* were on the coasts, and sea mammals were the focus of most hunting from them. The closeness of the people to the life of the sea mammals recurs in accounts of camp life. Movement away from camps has been a movement away from the *Inummariit*'s closeness to the sea mammals, on which they had been profoundly dependent.

This dependence was expressed in their attitudes to food. *Inummariit* preferred sea-mammal meat to all others. They delighted in fresh seal meat and whale skin and made the distinctions of a gourmet between the meats of various kinds of seal. Indeed they distinguished between the various cuts, bones and entrails of any one seal and knew how to blend one item with another to give each mouthful the best richness of flavour. The *Inummariit* preferred their food raw and enjoyed it rotten. In the settlement, many Eskimos still affirm these preferences, and a group who are expressively enjoying what they consider to be real food will comment on how good it is to eat *Inuttut*, that is, "as an Eskimo". When there is a dearth of such food, or when a visitor comes to a house that has no such meats, there is a familiar expression of regret, *Aittak niqimariqangitualuq,* "oh dear, there's no real meat at all". The same view is often pragmatically expressed in discussion about food in general: only the meat of sea mammals can protect a person against cold and hunger; other foods, including caribou and wildfowl, leave a man vulnerable to those dangers. As for the southern food they buy, delicious though it may be said to be, it lacks all the essentials of true food and is widely regarded as no more than an appetizer. When no food, no wild food, is available in a settlement, the Eskimos grow depressed. One summer, I saw some settlement hunters, who were well able to buy food at the local store, trying to shoot seagulls near the garbage dump to supplement store food with some real meat. It is a matter of pride, among Eskimos who take themselves seriously as hunters and trappers, to carry with them a minimum of "unreal" food, thereby acknowledging their dependence on the hunt and on the food of the land – food that will keep them warm and well-fed.

Their continuous talk of country food can be somewhat misleading. In the camps, Eskimos did not devote their whole time to hunting sea mammals, and they did not maintain an economy that focused exclusively on them. Although the value of such meat was considerable – equivalent to the income needed by a southern family to keep well-fed on high-

quality foods – their economic life spread beyond subsistence. How the *Inummariit* earned and still earn their living is revealed in recollections that show the ambivalence of contemporary attitudes toward camp life. Since this ambivalence focuses on material hardship and the struggle for livelihood, they reveal much about how the *Inummariit* made their living.

The economic life of camps at least since the 1920's was a blend of subsistence and trade. The Eskimos of today regard that blend as the essence of *Inummarik*'s life, and it is a combination of activities that many people in the settlements still pursue. Yet the *Inummariit* of the camps are significantly disginguished from modern settlement Eskimos by their hunting technology. Certainly the *Inummariit* trapped foxes, but they followed their trap lines by dog-team; they hunted seals by kayak in summer, by stalking them on the ice in spring, and by waiting at their breathing holes in winter. The *Inummariit* certainly had guns, but the settlement Eskimos of today wonder at the crudeness of those guns and respect the success achieved with an old-fashioned rifle, much as southerners respect a hunter who had only harpoon and bow. The principle is the same: these old-fashioned firearms, which had no telescopic sight, only a single shot, and were loaded with hand-made shells, made it necessary for a hunter to be close to his game. That ability was the surest measure of a hunter's knowledge and skill. Of course, the conditions of *Inummariit* camp life demanded competence in traditional technology. There was no cash surplus to acquire more sophisticated equipment, and there could be little improvidence in the use of purchased equipment. In a story about caribou hunting an old man told his children what real hunting was like 30 years ago:

> We walked far on the land every summer. The first day we walked a short way, and then each day a bit further. Then, after some days, we walked very far without being tired, until we came to the place the caribou were . . . When we shot a caribou we would line up two animals side by side and kill them both with one shot. In that way we would usually find the bullet lodged in the second animal, then that bullet could be used again. It could be used again because we mixed some grit with it, to make it the right size.

Of all the Eskimos' hunting skills, those involving caribou had probably changed least. But caribou never achieved commercial value and were of only marginal interest to white traders. To Eskimos, of course, they were essential for clothing, and at certain times and places, they might be as important as food. Once the trade period began most of the *Inummariit* were based at shore camps, and hunters usually had to make long journeys inland to reach caribou herds. The narrator of the story I have just quoted left his shore camp each summer with his entire family and walked hundreds of miles in search of caribou. Once that family had left the coast, they were beyond any assistance that traders or trade might offer; they had taken a step away from the mixed economy back to that of true subsistence.

It was trapping that broke the Eskimos' economic self-reliance, trapping for the fur trade. Before the traders began demanding fox skin, that resource lay at the very edge of a hunter's life. The *Inummariit,* however, were and are excellent trappers.

Stone-carving came to be important in the economy of camp life, and continues to be so in every settlement. The manufacture of tools, amulets, toys and talismans out of ivory, bone and stone predates the fur trade. But the sale of semi-artistic trinkets and momentoes to whalers and other white adventurers became important in the 1800's: cribbage boards, canes, scenes of Eskimo life scored on walrus tusks, small-scale dog-teams and the like had found their place alongside other souvenirs in some southern homes long before the commercialization of soapstone carving.

That commercialization got under way in the 1950's, when soapstone – which had long been used for making cooking pots and blubber lamps – was urged on Eskimos as a medium for artwork that might have great value in southern markets. Some of the motifs of these soapstone carvings are distinctively Eskimo, but their size, and many of their forms, have been conditioned by the marketplace if not by the somewhat idiosyncratic artistic sensibilities of one or two of the scheme's white pioneers. Eskimo carving, as it is now internationally known, is a consequence of southern domination of Eskimo economic life. Nonetheless, it is, like fox trapping, held to be among the *Inummarik*'s traditional skills. The *Inummarik* is said to have carved soapstone and trapped, and to have done both for trade.

Most Eskimos in the Canadian eastern Arctic today are engaged in hunting and trapping at least part of the time. However, the *Inummarik* is admired not only for these skills and for his ability to survive hardship, but also for an immensely detailed knowledge of the land itself. The *Inummariit* recognize very many species of plants and birds that no longer have, and in many cases never had, any importance for subsistence or trade. They also know of species that only rarely visit their lands and of some that are now unknown in the regions familiar to them. Such knowledge, which was once of enormous interest to all of the people, has only very recently begun to fade.

Knowledge of this sort has a specialized vocabulary. It is a form of knowledge that consists primarily in naming. The *Inummariit,* however, use a vocabulary with a special richness beyond the names of creatures undifferentiated by others.

In reminiscences of camp life, of the days when everyone spoke *Inummarittitut,* there are many references to the quality of life. To the Eskimo from the camps, the settlement seems crowded, impersonal and full of problems. In the camps, a group of families lived together by choice; anyone who felt

oppressed by discord or tension could easily move to another place.

The smallness of the *Inummariit* community conditioned the relationships that existed among the families in it. They looked to one another for help. Indeed, they had a strong right, almost a legal right, to each other's help. In a camp, the Eskimos were their own masters, neither directly supported nor manipulated by outsiders. The *Inummariit* hunters were men of great influence and authority, equipped by experience and ability to make decisions that affected the community and their own families. It may seem that this essay is only a historical reconstruction of the *Inummariit*. Discussion of Canada's native peoples has often begun with the axiom that there remains at present only a lingering trace of traditionalism and that in future there must be an even more complete absorption of the natives into the mainstream of national life. According to this axiom, signs of modernity are signs of an ineluctably disappearing tradition. Behind the axiom, however, lies the fallacy of defining tradition in the terms of classical social anthropology as the customs of pre-contact culture. To contemporary Eskimos, tradition has nothing to do with pre-contact culture. The *Inummariit* are a small group, but it would be wrong to think that the present size or the likely future size of this group is any indication of the value of the tradition that the group embodies.

Few as the *Inummariit* are and further threatened though they may be, they are still seen as the representatives and spokesmen of a traditional life that almost all Eskimos identify with and admire.

Part IV

Inuit and the Land: A Photo-Essay

by Terry Pearce

They have been there for generations.
These Inuksuit have always helped us and have even kept us from starvation.

Some are on the high planes pointing skyward acting as guides to lead us over the right paths. When a man travelled by kayak along the rivers and sea, his family followed overland guided by the Inuksuit. Other Inuksuit were made to conceal a hunter from the caribou, or to mark a caribou crossing place by a river or lake, and they were landmarks we could follow in very foggy weather. They also indicated a good lookout point on high land, or the exact spot where the fishing was good, and how plentiful the fish were. A good soapstone quarry from which oil lamps and stone pots could be made, an old campsite, or a place where food had been cached – all of these places were marked with different kinds of Inuksuit.

Glorious it is
To see young women
Gathering in little groups
And paying visits in the houses –

Then all at once the men
Do so want to be manly,
While the girls simply
Think of some little lie.

I have known food supplies exhausted,
I have been in the midst of it when there was joy,
And all of these take some strength to go through.

I have fished ever since I was a little girl,
And I still enjoy fishing today.

My parents were real Inuit. In those days we all wore caribou clothing and lived off the land just as our ancestors before us. Now the young people going to school cannot live that way anymore.

I am not the same as the children who are growing up in the settlement. Now we are different from our children who were born from us because they are being educated by the white people.

This is our land and we have lived here all our lives. We don't want to forget the way the Inuit lived here for centuries and we want to continue for centuries to come.

And I remember my father telling me how they used to catch caribou with bows and arrows.

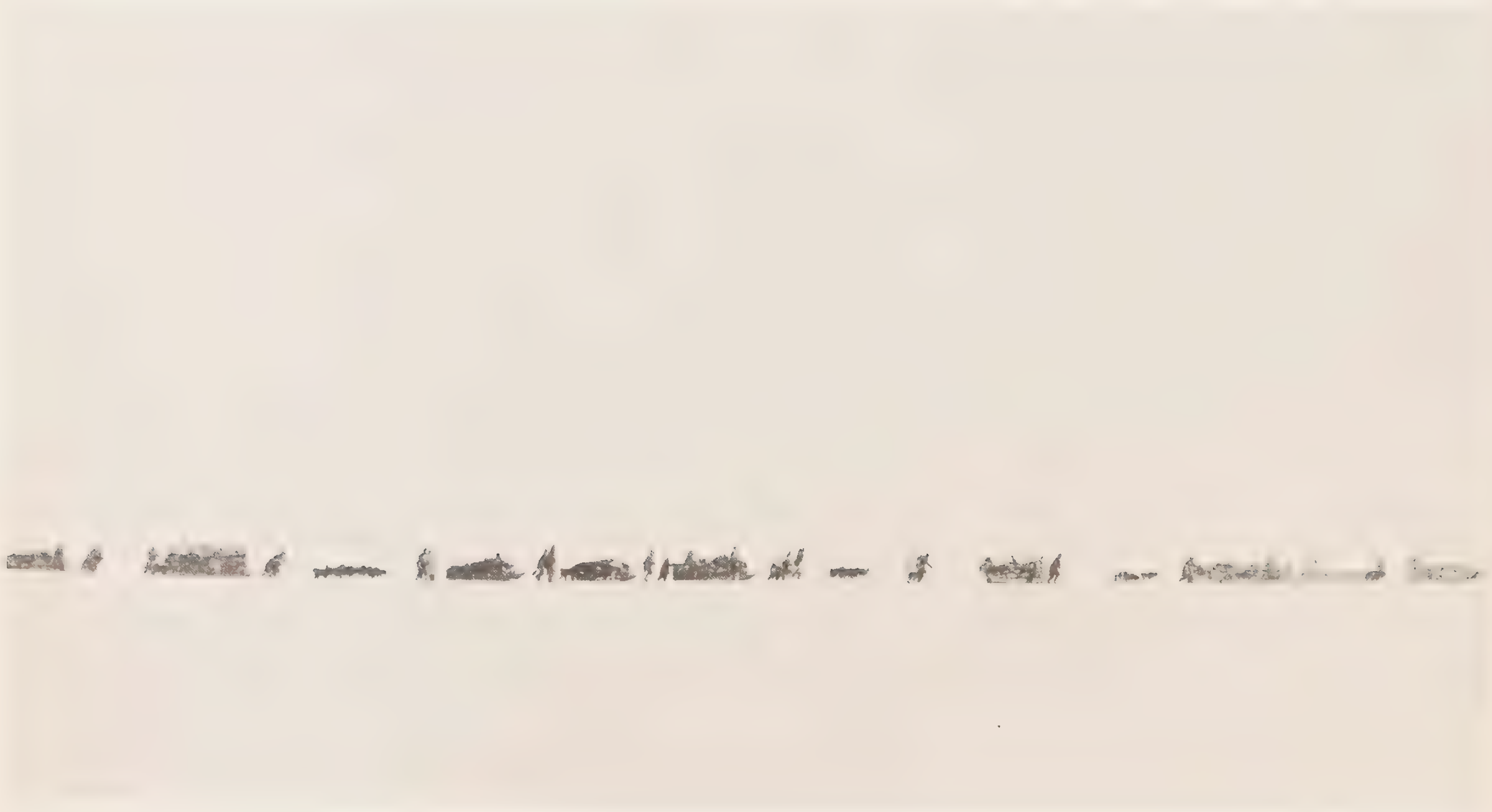
Mark you there yonder?
There come the men
Dragging beautiful seals
To our homes.

Now is abundance
With us once more,
Days of feasting
To hold us together.

Know you the smell
Of pots on the boil?
And lumps of blubber
Slapped down by the side bench?

Joyfully
Greet we those
Who brought us plenty!

We went to places far away by dog-team and boat. Then, as I became older, I started taking trips on my own in an area where my father had taught me.



I also remember times during my childhood when we were travelling. I remember the time when I was walking while tied by a string to the sleigh. We had only one dog and my mother and father were pulling on each side. As I watched my sister sleeping on top of the load my legs became tired from walking so I just let them drop and let the sleigh pull me along.

Great Sea
Sends me drifting,
Moves me,
Weed in a river am I.

Great Nature
Sends me drifting,
Moves me,
Moves my inward parts with joy.

The great sea
Has sent me adrift
It moves me as the weed in a great river,
Earth and the great weather
Move me,
Have carried me away
And move my inward parts with joy.

I arise from rest
With the beat of a raven's wings.
I arise
To meet the day.

My eyes turn from the night
To gaze at the dawn
Now whitening.

The Inuit made a weir across the whole inlet so that when the fish got into the inlet and up to the lake they wouldn't be able to get back out.

The fishing weirs are very, very old, originally built by our ancestors. Everyone enjoyed fishing in these weirs. The men hooked the fish and threw them on the land or put them on a line they carried while the women cleaned the fish.

We really enjoy fishing and know a lot about fish. Year after year we enjoy fishing.

I will walk with leg muscles
which are strong
as the sinews of the shins of the little caribou calf.

I will walk with leg muscles
which are strong
as the sinews of the shins of the little hare.

I will take care not to go towards the dark.
I will go towards the day.

The animals were made so that Inuit could survive in this land
and we are trying our best for the future survival of the Inuit.

If I were asked: "Are you happy with your land?", I would answer, "I am very happy with it". Because it has many animals and you can see for miles. It may seem barren but if you travel, there are many animals to be seen, which are enjoyed by all Inuit.

When I was young and out hunting with my father we used to have good times together. I did not know that I was being given an education, but without my knowing it, he was teaching me the Inuit way of doing things. I can remember thinking to myself that I would be very glad when I am able to do all these things myself.

There aren't too many jobs available and some Inuit have never had a job. Hunting for Inuit food is best for us, and we also get money for the skins. The skins will never be thrown away because, even if they're not sold, they have other uses.

The land is lived on only because of the animals we hunt, just as our ancestors did. That is why we live here.

Dog-teams can go where a skidoo can't. Like ice that is starting to break up. I have travelled with my dogs where a skidoo never would.

When someone leaves by skidoo and stays away too long, you start worrying. With dog-teams you don't get worried even if they stay away for a long time.

It is very awesome when we think about this land.

I grew up living off the land and it grew into me, as did the way of animal hunting.

At one time the older people used to make rules for the younger people. They used to say not to use rifles on the ice in the spring because they made too much noise – we should use only harpoons in the spring time.

The most important thing is the animals – where they stay – and the best places to catch them.

A person is born with the animals, he has to eat animals, and that is why the animals and people are just as one. That is the way we think.

Winter, spring, summer and fall are all different. Just like the land itself. When the land changes the Inuit way of life changes together with the land that is changing.

Glorious it is to see
Early summer's short-haired caribou
Beginning to wander.
Glorious to see them trot
To and fro
Across the promontories,
Seeking a crossing place.

Down south they kill a lot of cattle and other animals for food. It is the same with the Inuit – we need food from the animals of this land.

Inuit appreciate what they get and share their food. Even today we eat and share the same food with others.

We often think about the children's future and that is why we hope the animals will survive for centuries to come.

The Inuit were born to hunt and look after themselves. In the past, even though we may have been poor, we were nearly always happy. It was that way until the government came.

Most of us didn't know our future when we first came to the settlements. We went along with the change, thinking that, if it didn't last, we could always go back to our camps. But we ended up living here and learning to live to the standards of what's happening now. It takes longer for us to realize just what we are getting into, because we are still in the learning stage of this change. There wasn't much choice really, we had to go along with the change, and some of us didn't want to.

Every land I have lived on had me use my strength, put me in a state of living needs. I have gone through them all.

Food prices are now very high in the north, and the people are sustained mainly by meat from the land, which is what they have always been used to. So it would be better if the Inuit had control over the land.

My ancestors have lived here for generation after generation, and we are still living here today. We want our children to live on this land, and also, their children in the future.

Today most of the younger people are learning the English language – but they don't learn everything. They learn part of the white man's way of life, and part of the Inuit way of life. It seems they are sort of in between.

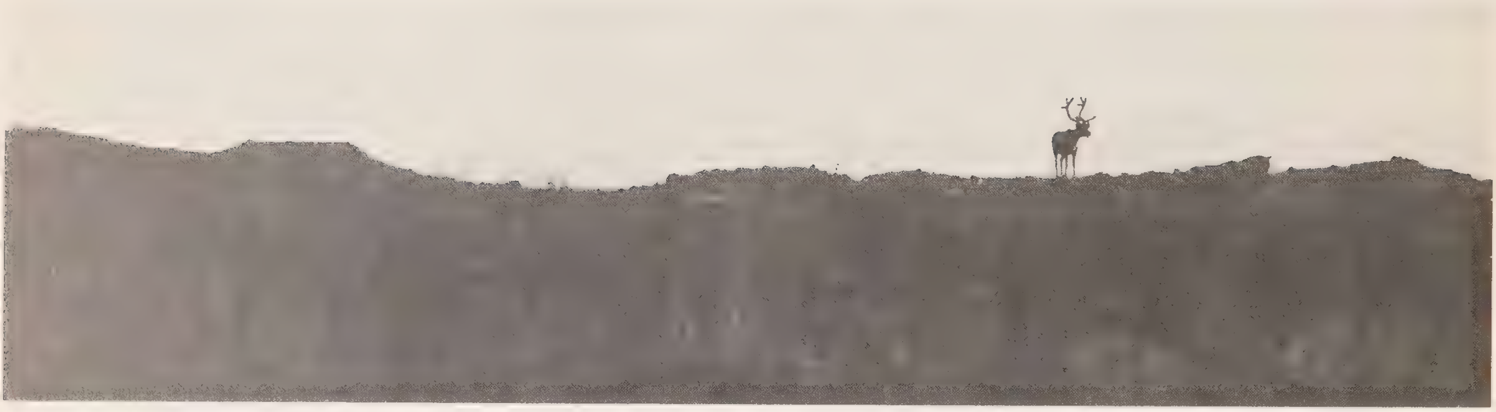
I want the young people to learn and remember the old ways and the old skills, so that they can hunt and travel on the land, so they can live and know how to build igloos, so they can survive and look after themselves properly.

This land is going to belong to our children. It is going to belong to them and it is going to be right, like we used to have it in the old days.

We are really thinking about our children – of building a good livelihood for them when they grow up, so they know how people lived in the past. This is the reason we older people are trying to protect this land.

We have a bible and a prayer book, and it says that there's a life after, even if we don't have food anymore. The priests didn't really change our way of life. We went to church and prayed, but after church, we still practised what we had done before the missionaries came. Even today I still think of shamans.

With working, making money is the only thing. It's tiresome and you only think of getting paid. With hunting, it's good to do, and it's not tiresome. There is the food to look forward to, and the way the skin will be used.

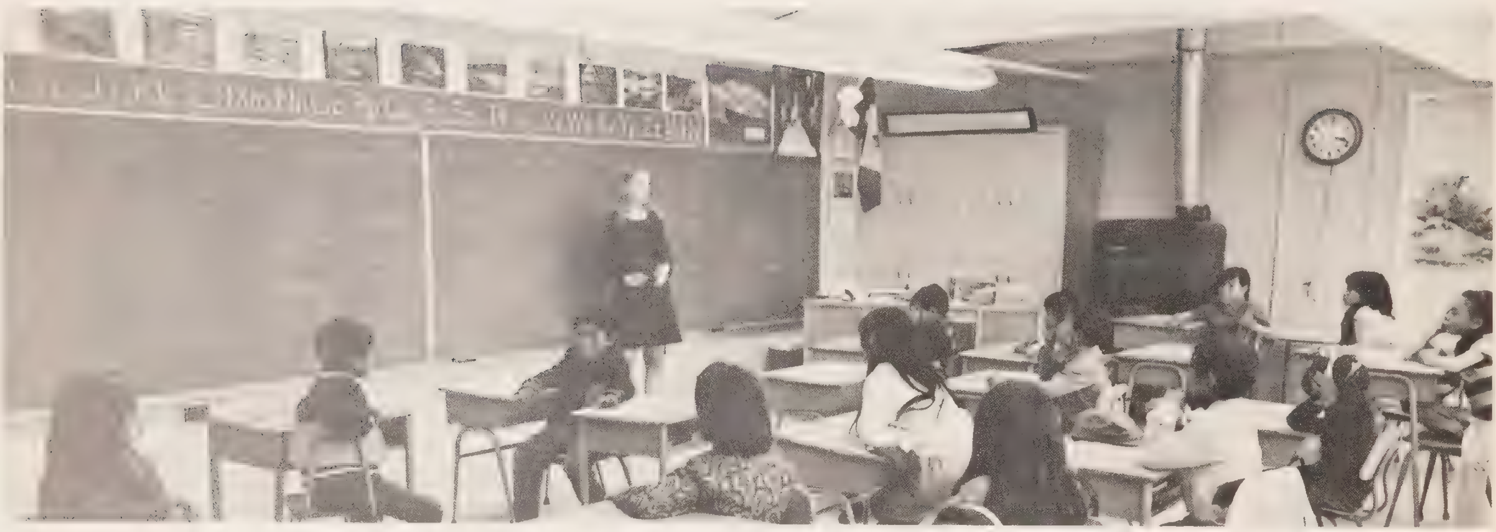


Here I stand
Surrounded with great joy.
For a caribou bull with high antlers
Recklessly exposed his flanks to me.
– Oh, how I had to crouch
In my hide.

But, scarcely had I
Hastily glimpsed his flanks
When my arrow pierced them
From shoulder to shoulder.

And then, when you, lovely caribou,
Let the water go
Out over the ground
As you tumbled down,
Then I felt surrounded with great joy.

Glorious it is
To see great musk-oxen
Gathering in herds.
The little dogs they watch for
When they gather in herds
Glorious to see.



I want what we have learned to be learned by our children too, both the white people's way and the Inuit way. I want our children to be taught both ways, because sometimes there are no jobs here on our land.

Are we going to change totally, or shall we hang on to what we have got and what used to be? I guess it's going to be the next generation which will show us. The way things are going, the next generation will really determine what is going to happen to the Inuit culture.

Photo credits

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Information Canada, pp. 229, 234, 242, 243, 245, 251, 254, 256, 257, 258, 259, 260, 262, 263, 264, 265 top, 266, 267, 269, 270 left, 271 right, 273, 274, 275;
National Museums of Canada, pp. 230, 232, 233, 235, 236, 237, 238 bottom, 239, 240, 246, 247;
Public Archives of Canada, pp. 231, 238 top, 241, 244.

Verses are taken from "*Anerca*" by Edmund Carpenter. J. M. Dent & Sons (Canada) Ltd., Toronto. 1959.

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